MAY 21, 1951

STEEL

The Weekly Magazine of Metalworking

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Transportation

HUB OF DEFENSE —on page 57

Housing—Still Big Business for Metalworking, p. 47
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EC&M
Magnetic Control

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2 Line-Arc Contactors
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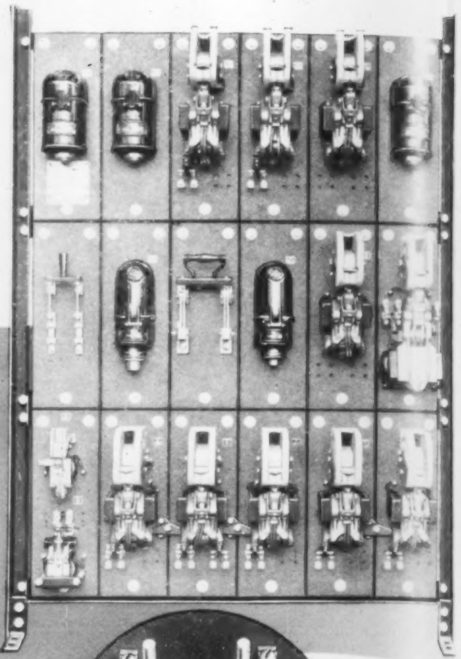
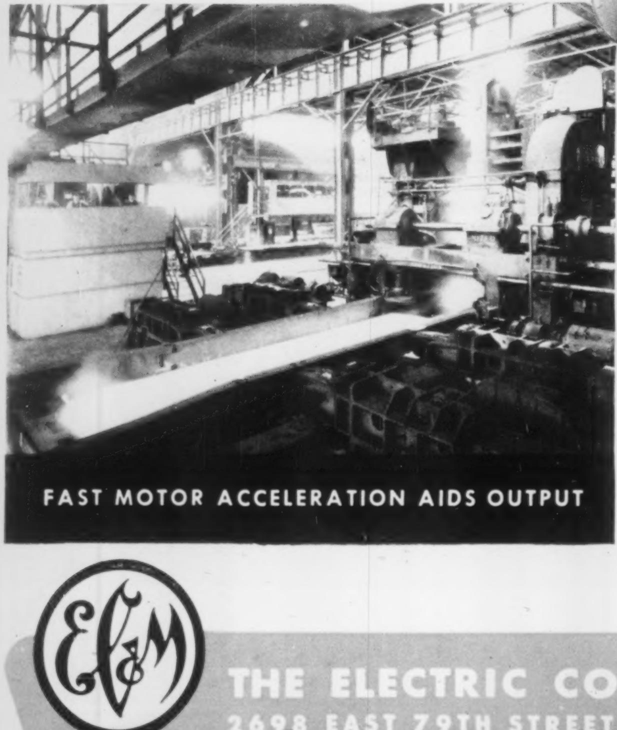
4 Tab-Weld Resistors
5 Cam Master Switches
6 Safer Electrical Interlocks
7 Bolted, Welded Frame
8 Quick Contact Renewing

TIME-CURRENT *Acceleration*

- SPEEDS MOVEMENTS
- SAVES MOTORS



Only one moving part in the TIME-CURRENT acceleration relay—magnetically centered in its short movement.



FAST MOTOR ACCELERATION AIDS OUTPUT

An exclusive characteristic of the *Time-Current* Acceleration Relay is its ability to vary the time-per-step by self-adjustment. When stiff grease on cold mornings increases the load, these relays automatically provide longer time to enable the motors to get under way without tripping the overload relays. As the mill warms up, these relays shorten the time — speed up motor acceleration until production is normal. This self-timing feature is unequalled in any other system of acceleration.

Note, too, the dependable construction of these relays — only one moving part — magnetically centered — no wear to alter the adjustment — in fact, many hundreds of these EC&M relays are successfully operating with their original (factory set) adjustment unchanged. Specify EC&M *Time-Current* Control.

THE ELECTRIC CONTROLLER & MFG. CO.
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STEEL
The Weekly Magazine of Metalworking

VOL. 128 NO. 21 MAY 21, 1951

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Next Week . . . **More Production from Steep-Angle Milling . . . 20 Miles of Pipe per Day . . . How's Your Supply of Skilled Welding Operators? . . . Production Boosted with Same Machine Tool**

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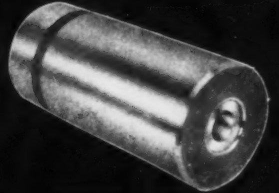
ELGIN ANNOUNCES

A COMPLETELY NEW, FASTER CUTTING DIAMOND ABRASIVE COMPOUND SPECIALLY DESIGNED FOR FINISHING CARBIDE

WIRE DRAWING DIES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Six months of actual shop tests prove DYMO-C removes stock up to 20% faster than diamond powder—olive oil mixtures. In DYMO-C, mixing is eliminated . . . waste reduced . . . "slinging" minimized. Available in jars or applicator guns. Write today for complete information and free demonstration.

ELGIN DYMO DIAMOND COMPOUND . . . pure diamond—crushed, precision graded and compounded by one reliable source—ELGIN. Guaranteed to conform to U.S. Bureau of Standards specifications.

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ELGIN NATIONAL WATCH CO.
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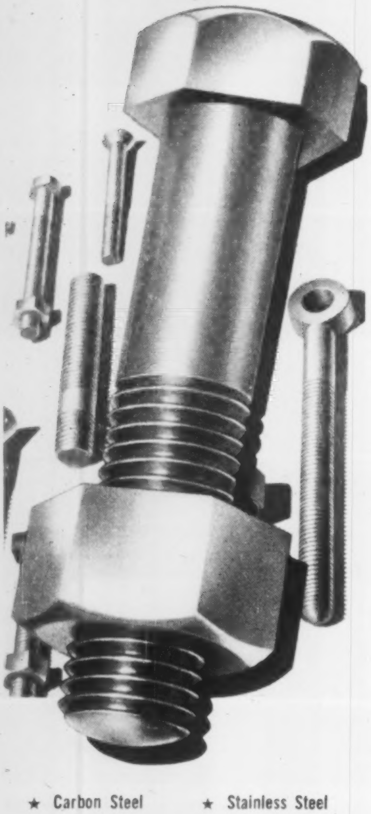
First for
BOLTS
NUTS
STUDS



★ Carbon Steel
★ Stainless Steel
★ Heat-treated Alloy Steels
★ Silicon Bronze
★ Naval Brass
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THE PLACE TO SOLVE YOUR BOLT PROBLEMS
T.M. REG.

Behind the Scenes . . .

The Conversion Factor

After taking delivery of a new Oldsmobile Super 88 Holiday Coupe the other day, one of our editors (those boys really live!) was loafing along a city street and was amazed to find the speedometer read 60. Looking more closely he found the instrument dial graduated up to a top of 180. Next he found that in traveling the 5 miles from office to home, the odometer (mileage indicator to the laiety) read 8.0.

Finally the light dawned. Through some strange mystery of mass production the car had come out with a speedometer reading in kilometers. This Continental influence may be a nice thing to have, but it calls for a lot of mathematics, what with 1 mile equaling 1.609 kilometers, so our confused editor is just shutting his eyes to the instrument panel and trusting to a kindly gendarmerie.

Battleship Steel

In a short time somebody is going to be using a Yale & Towne industrial truck built partly from Krupp-rolled deck plates from the German battleship, *Bismark*. Like practically every other metalworking company, Yale & Towne has been hard pressed for steel. To augment stocks, it has been buying from abroad. One shipment of plates arrived with the Bismark imprint on them. Presumably, the steel was salvaged from the German vessel.

Solved: The Steel Shortage

The *Buffalo Evening News* of Apr. 24, 1951, has solved the steel shortage, and very neatly too. The newspaper reports: "Youngstown Sheet & Tube Co. is nearing the point where approximately 50 per cent of its production will be in the Chicago area. Present expansion will cost about $100,000,000 and add about 1,000,000,000 tons to ingot capacity." Alas, if only those last three zeros on the tonnage figure could be added as quickly by engineers and construction men as they are by the flying fingers of the typesetter.

For That Youthful Figure

Hurry, hurry, hurry. For a short time only and just while our limited supply lasts, we shall give away absolutely free a diet for calorie-conscious metalworking men, and women. You will get a handy-sized card that will give what you should weigh according to your age and height, a healthful diet for breakfast, lunch and dinner and the calories contained in common foods.

The diet card comes from Wysong & Miles Co., Greensboro, N. C., maker of power squaring shears, grinding and polishing machines, disc grinders and power slip roll forming machines. The gentlemen we've met from that company look spruce and fit. Perhaps the information on their card can tell you how they got that way.

For your free copy of the diet card, write Shrdlu, STEEL, Penton Bldg., Cleveland 13, O. We're going to start the diet next Monday. Wysong & Miles says we're 7 pounds overweight.

Puzzle Corner

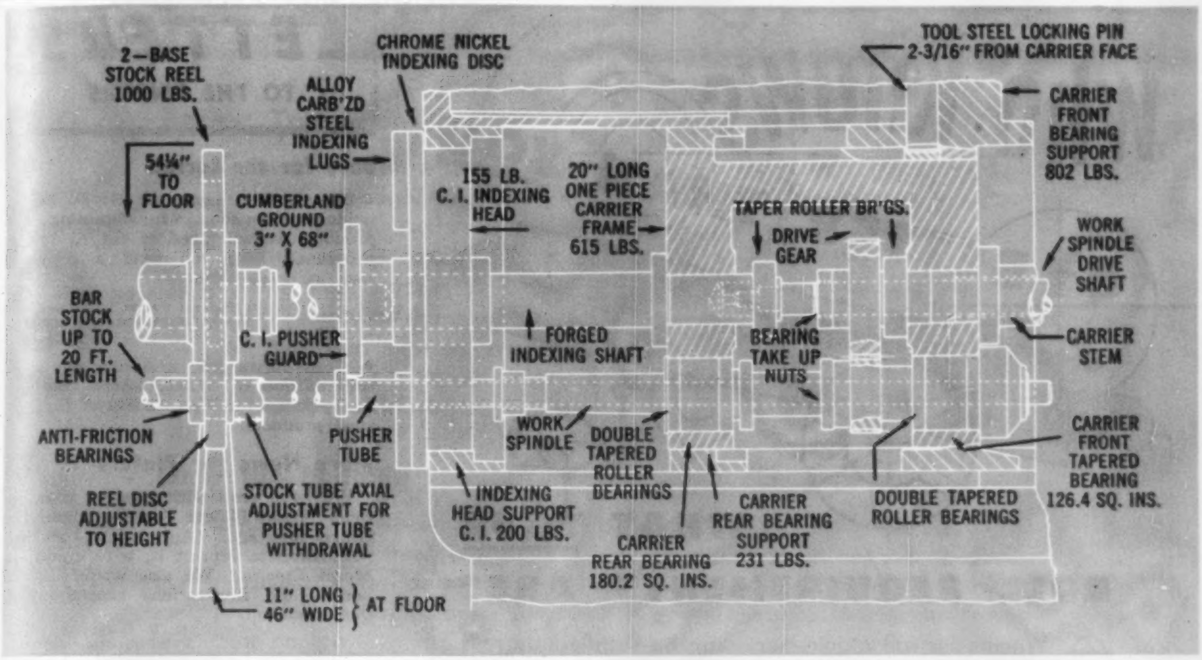
First in with a correct answer to the word problem of May 7 was C. I. Gardner of Orinoco Mining Co. He says that in less than 5 minutes, without consulting a dictionary, he jotted down these eight words ending in "uous": Innocuous, virtuous, voluptuous, deciduous, continuous, contiguous, sumptuous, tempestuous. It took him two more minutes to think of arduous and unctuous. Here are a few more: Contemptuous, fatuous, incestuous, incongruous, inconspicuous, ingenuous, mellifluous, presumptuous, strenuous.

The next puzzle was submitted by someone who did not sign his name, maybe because he wants no attacks upon his person from addicts who have sweated over the thing. Art, Bob, Charlie and Dave were pitching pennies against a wall. On each round they all would toss the same number of pennies and the one who tossed the penny landing closest to the wall won all the pennies tossed. They played three rounds. Art used ½ his pennies plus ½ a penny on each round. Bob used ½ his pennies less ½ a penny on the first and second rounds, and 1/10 of his pennies less 1/10 a penny on the third round. Charles used 1/3 his pennies less 1/3 a penny, 1/12 of his pennies less 1/12 a penny and 1/22 of his pennies less 1/22 a penny on the three rounds respectively. Dave used 1/3 of his pennies plus 1/3 a penny, ¼ of his pennies plus ¼ a penny and 1/6 of his pennies plus 1/6 a penny on the three rounds respectively. Charlie, Bob and Art were the winners in that order.

They then found out that Charlie's winnings less Bob's winnings were 24 cents more than Dave's losings less Art's losings. How many pennies did they each have at the end of the game?

Shrdlu

(Metalworking Outlook—Page 39)


2—BASE STOCK REEL 1000 LBS.
54¼" TO FLOOR
ALLOY CARB'ZD STEEL INDEXING LUGS
CHROME NICKEL INDEXING DISC
CUMBERLAND GROUND 3" X 68"
155 LB. C. I. INDEXING HEAD
20" LONG ONE PIECE CARRIER FRAME 615 LBS.
TOOL STEEL LOCKING PIN 2-3/16" FROM CARRIER FACE
CARRIER FRONT BEARING SUPPORT 802 LBS.
TAPER ROLLER BR'GS.
DRIVE GEAR
WORK SPINDLE DRIVE SHAFT
BAR STOCK UP TO 20 FT. LENGTH
C. I. PUSHER GUARD
FORGED INDEXING SHAFT
BEARING TAKE UP NUTS
CARRIER STEM
ANTI-FRICTION BEARINGS
PUSHER TUBE
WORK SPINDLE
DOUBLE TAPERED ROLLER BEARINGS
CARRIER FRONT TAPERED BEARING 126.4 SQ. INS.
REEL DISC ADJUSTABLE TO HEIGHT
STOCK TUBE AXIAL ADJUSTMENT FOR PUSHER TUBE WITHDRAWAL
INDEXING HEAD SUPPORT C. I. 200 LBS.
CARRIER REAR BEARING SUPPORT 231 LBS.
DOUBLE TAPERED ROLLER BEARINGS
CARRIER REAR BEARING 180.2 SQ. INS.
11" LONG 46" WIDE } AT FLOOR

FIRST THINGS COME FIRST

Upon the Spindle Carrier of an "Automatic" falls the responsibility of accurately presenting and holding the work to — and in contact with — the tools. The basic design of the Carrier is obviously of first importance in the protection of the work spindles from the strain of heavy cuts and weight of the bar stock. Then, in proportion to the Carrier's ability to handle the full load is the importance of any supplementary facility that shares the load.

1. **The 1½" Six Spindle CONOMATIC CARRIER gives better support to the work spindles under heavy loads.**

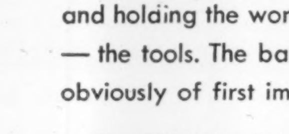
   The thick, heavy ribs resist strain. The tapered front bearing and the spindle drive gears are within 3" and 9¼", respectively, of the collet faces. The wider spaced bearings give better alignment and load distribution. The Carrier is free of Cross Slide positive stop pressure.

2. **The entire INDEXING MECHANISM is supported by the Top Bed as well as the Base. There are fewer wearing parts.**

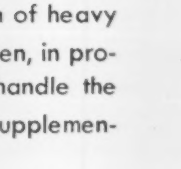
   The Indexing Head takes the brunt of the indexing load. It is supported by the short frame member midway between the Carrier and the Stock Reel. It is joined to the latter by strong center shafts.

3. **The STOCK REEL is designed to handle longer and heavier loads.**

   The two Stock Reel Bases are independent of the machine and relieve it of the heaviest part of the bar load during the cutting and indexing movements. Adjustable alignment gives freer stock-feed action.



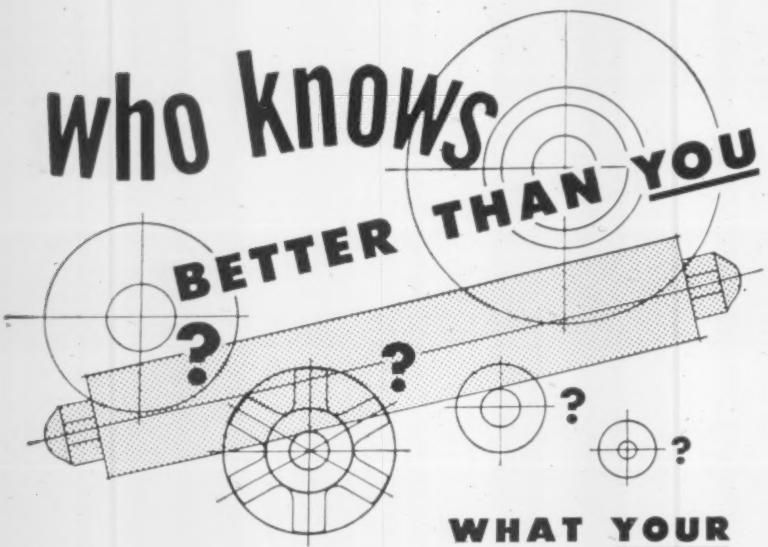
Buyer's Comparison Chart will guide you to full information



A Comparison of ALL Automatics is in Favor of Cone

6 Conomatic

CONE AUTOMATIC
MACHINE COMPANY, INC.
WINDSOR, VT., U.S.A.



WHAT YOUR ROLL REQUIREMENTS ARE?

When your roll requirements can be satisfied by rolls built to liberal tolerances you don't want the expense of dimensions held to a "tenth" . . . and when you must have rolls with critical tolerances around that "tenth" you can't afford *not* to get that precision . . . *the first time!*

That's where Gorham rolls fit into your picture. We're completely equipped and qualified to fill your requirements in cold mill rolls, including working rolls, intermediate rolls, drive rolls and specials. *Your* specifications run the show. When you want ordinary commercial tolerances, that's what you get . . . and when you require extremely close tolerances, our experience, equipment and skilled personnel assure you precision, right on the "tenth".

Gorham rolls are manufactured from the steel best suited to your job, properly heat treated for correct hardness and wear resistance and ground to the dimensions and finish *you* specify. We furnish a wide variety—from small rolls for the smallest Sendzimir precision strip mill up to rolls 14 inch diameter, 6 feet long. Gorham field service engineers, who can give you valuable assistance, are conveniently located in principal industrial centers.

We invite you to join the list of operators *and* manufacturers of rolling mills whom we now serve. You'll find us a convenient and cooperative source for your roll requirements. Send us details of your rolling problems for recommendations, or your roll specifications for a prompt quotation.

Gorham TOOL COMPANY

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LETTERS
TO THE EDITORS

Bars for the Barred

We are informed that STEEL has a guide showing sources for obtaining steel products we will need in our Army cot program. Will you send a copy as soon as possible?

E. C. Rains, purchasing agent
Federal Prison Industries Inc.
Federal Correctional Institution
Milan, Mich.

• *Copy forwarded; also accept a current edition of* STEEL, *where you will find prices on a wide variety of finished steel products.*

More News for Platers

We have read with interest your article, "What Platers Can Do About the Nickel Shortage," (Apr. 2, p. 81) and ask permission to reprint it, with credit, in *Metal Treating*. We also would like to borrow the illustrations accompanying the article.

C. E. Herington, editor
Metal Treating Institute
New Rochelle, N. Y.

• *Permission granted; illustrations forwarded.*

Alloying: Two New Patents

STEEL reports a new diffusion alloying process developed in England (Mar. 5, p. 79.) Where can we learn such additional information as types of steel treated, times and temperatures involved and the physical properties obtained?

E. F. Rosholdt
research & development chemist
Hamilton Standard Division
United Aircraft Corp.
East Hartford, Conn.

• *The item is based on two British patents: No. 647,004, assigned Dec. 6, 1950, to Marcel Formstecher, Grand Place, Arques, (P.D.C.), France and Curt Grunberg, Claygate, Lye Green Road, Chesam, Bucks; and no. 647,748 assigned Dec. 20, 1950, to Franz Halla, Moritz Neissner and Erich Fitzer of Technische Hochschule, Institut fur Physikalische Chemie, Dreihufeisengasse 4, Vienna VI/56, Austria.*

Where '50's Steel Went

Can you send me a breakdown of 1950 steel production by product and market classification?

Leo F. Caproni
Caproni Associates
New Haven, Conn.

• *See* STEEL , *Apr. 16, pp. 54-55.*

Spotting Stainless

Have you any guide available for stainless steel products as complete as your "Guide for Steel Buyers" is for carbon steels? The aircraft industry uses stainless of all types, many not carried in warehouses and difficult to find a mill to produce.

William W. Clark, purchasing agent
The Engineered Products Co.
Flint, Mich.

• *At this date no plans are made for future publication of a guide for stainless steel buyers. However,* STEEL'*s market summary lists each week producers of stainless steel, with types and location of products.*

The Metalworking Outlook

Rocky: Transition to CMP

Transition to an effective Controlled Materials Plan is going to be rocky. Although CMP starts July 1, you will see few real benefits until October. Action on the steel phase of the program has already resulted in miscues. NPA announced 24 June allocations programs for the steel industry as a preliminary step to full implementation of CMP. Many of the programs were made known after the lead times for June had expired, and mills had to scramble their schedules to work them in. Result: Many lower-priority customers are out of luck on June deliveries.

Omit the Padding

CMP officials know that some claimant agencies are padding their figures on the steel, copper and aluminum they think will be needed, particularly for defense-support programs. All proposals for such projects are going to be subjected to more skeptical inspection from now on (p. 48). If CMP people find proof of flagrant padding, woe be to that program and to the companies dependent upon it, because the project will be slashed to the bone.

Too Many Complaints?

Small business may be protesting too much. NPA reaction to the many complaints from smaller companies both to it and to Congressmen is becoming: "We've heard that song before." NPA believes the little fellow is getting reasonable treatment through generous materials allotments to warehouses. NPA now is even raising the question of whether steel warehouses are getting too much. They are permitted 85 per cent of the steel they received during the base period.

Clue to the Steel Shortage

Some 52 per cent of the total steel production went into defense and defense-support programs in April. But the catch is that 80 per cent of the alloy steel went for defense and defense-support, 50 per cent of the sheet steel and about 5 per cent of the wire and tin plate. In that imbalance among products lies the clue to the steel shortage. The nonrated civilian market needs 1 million more tons of steel a month than it's getting, and most of that is required in alloys and sheets. The deficit will increase in coming months.

Aluminum Controls: Too Tight?

Aluminum controls thus far have been a shade too severe. There are instances, notably among truck-trailer manufacturers, where companies can get all the aluminum they need, controls or no controls. That situation probably will end in June because Aluminum Co. of America figures that less than 10 per cent of its production next month will be free. Some 60 per cent will go to defense and related efforts, 20 per cent to government stockpiles and more than 10 per

Production-Engineering News—p. 75 The Market Outlook—p. 143

cent to farm applications and the electric utility program. Alcoa thinks the government stockpiling requirements are excessive.

Price Drop Temporary

Expect steady or slightly declining prices for the next two or three months. Price controls are beginning to take effect; stability is also aided because the feverish pitch in consumer buying is over. Prices in the week ended May 8 dropped 0.5 of a point. But the softening is only temporary because defense spending will take hold by August or September and put an upward pressure on prices again.

Small Buying Spree Likely

Watch for a small consumer buying spree to start as a hedge against higher excises on autos, television sets, radios and other items being considered by Congress. The House Ways & Means Committee will not go as high on excises as requested by the Administration. So far, it has raised excise rates enough to bring in an additional $1086 million from that source. The total additional revenue raised by the committee so far in its tentative voting on the 1951 tax bill is $6546 million.

Labor Recruiting Ideas Bloom

Having trouble in recruiting labor? In a survey of 51 companies, Associated Industries of Cleveland finds that more than 80 per cent of the firms rely principally on three methods: Newspaper ads, contacts at schools and colleges and use of private and public employment agencies. Imaginative approaches used only by a few companies but found effective include operation of a mobile employment trailer with advance advertising on its location and contacts with welfare organizations and churches to hire displaced persons coming to this country from Europe.

Straws in the Wind

Northwestern Steel & Wire Co. has ordered two 125-ton electric melt furnaces from Pittsburgh Lectromelt Furnace Corp.; they'll be the largest electric furnaces in existence . . . Republic Steel Corp. is supplying some of the materials needed to convert three Liberty ships to Great Lakes ore carriers at Newport News, Va.; Republic hopes the vessels, to be brought through the lakes via inland waterways, can be converted in time to bring down iron ore this season . . . The Air Corps is modifying its quality control specifications for aircraft that first came out Dec. 8, 1950; revised specifications will be available soon . . . Westinghouse Air Brake Co., Union Switch & Signal Co. and Westinghouse Pacific Coast Brake Co. are considering merger.

Here and There in Industry

A surprisingly high total of 775,000 houses may be started in 1951 (p. 47) . . . A closed-end CMP is likely by the first of next year (p. 48) . . . Mobilization Committee on Iron & Steel Scrap has been formed to help get 32.5 million gross tons of purchased scrap in 1951 (p. 48) . . . More steel, aluminum and copper is being set aside for machine tools in the third quarter (p. 51) . . . Transportation facilities are not quite adequate for a defense economy (p. 57).

A Great Asset

One wonders whether Americans realize the importance of good transportation to a nation's economy or appreciate the superiority of our system over those of other large countries.

China and Russia are countries of extended area where deficiencies in transportation are readily apparent. For lack of even primitive transport thousands of Chinese starve to death on frequent occasions simply because food that is available only a few hundred miles away cannot be delivered to the stricken areas in time. The limited capacity of Russia's rail lines from her industrial west to strategic points in Asia is a handicap that must worry the men in the Kremlin no end.

In the United States we are blessed with a fortunate combination of railways, highway trucking, Great Lakes carriers, inland waterways, pipelines and airborne freight. Last year these facilities rendered a service totaling 1023.14 billion of ton miles of transport. Of this total, 59.1 per cent was handled by the railroads, 13.5 per cent by pipelines, 11.6 by Great Lakes carriers, 11.2 by trucks, 4.5 by inland waterways and 0.01 per cent by aircraft.

In spite of this impressive performance, demand for transportation is somewhat greater than our ability to provide it. Each method of transport has its own peculiar problems. The railroads need more freight cars. The truckers are hampered by an inadequate highway system. Pipeline interests suffer from scarcity of steel.

Fortunately, for the most part these handicaps are temporary. They can and will be overcome. One reason why they will be overcome is because in the United States transportation facilities still are being managed under the free enterprise system, under which individual initiative, resourcefulness and ability can operate freely. In fact, it is this system which is largely responsible for the present superiority of our transportation service over that of any state-owned service in any other large country.

Our great need at the moment is a greater consciousness on the part of the people and of their representatives in Washington of the great advantage we have in privately owned transport. We should resist vigorously every attempt to socialize this asset.

E. L. Shaner

EDITOR-IN-CHIEF

DON'T WAIT FOR DRIVE: Another series of intensive drives to collect iron and steel scrap is in the offing. Efforts will be made to speed the flow of this material from every important source. Obviously this movement should have the wholehearted support of everybody in the metalworking industries.

However, every reader of this page realizes that any mass appeal to the public can net only a fraction of the tonnage that will come from industry itself. Executives of railroads, public utilities and all producing and manufacturing industries should not wait for the formal drives. They can act now and to good effect.

Simply give orders that all obsolete or otherwise unusable ferrous material be collected and sold to your scrap dealer now. See that turnings, stampings and all other scrap generated by manufacturing operations go into the market promptly. Finally, use your influence to see that any good scrap available in your community—such as abandoned street car rails—really goes back to the furnaces. —p. 48

* * *

STEEL FOR HOUSING: Estimates by construction experts as to the number of new non-farm residences to be started in 1951 range from 700,000 to 850,000. If one takes the mean, 775,000, as a fairly reasonable figure, it is evident that housing is going to require a substantial tonnage of metalworking products. About 4.5 tons of iron and steel products go into the average house. They include nails, hardware, furnace, radiators, water lines, plumbing fixtures, gutters, appliances and many other items.

Sellers of these products must divide their limited supplies between this demand from new homes and the replacement market, which is substantial. It will be a nip and tuck proposition on some items, but some suppliers believe the challenge can be met. —p. 47

* * *

DELIBERATE DECEPTION: It is amusing to note that some of the bureaucrats in NPA are wrangling with their associates temporarily on leave from industry over the propriety of certain common current expressions. The career men do not like "substitute" as applied to materials. They say it denotes cheap ersatz goods. They would use the term "alternate materials." They dislike "scarce" on the score that it is bad psychologically. They propose the term "relative criticality." Also they think "relative availability" is a great improvement over "limitation."

It is reported that the industry men say "nuts" to this pussyfooting lingo. They think that what is needed is "somebody with guts enough to tell people they can't have materials." Come to think of it, we wonder how many millions of man-hours per month are spent in Washington in efforts to develop gobbledygook and other deceptive language designed to pull the wool over the eyes of long-suffering taxpayers. —p. 54

* * *

UNWANTED SERVICES: We are intrigued by this sentence in a dispatch from Washington: "So diversified are the services available from Washington that the average citizen is sure to benefit from reading the new book entitled 'How to Get It from the Government.' "

We have no quarrel with the book. Probably it is a good treatment of the subject. But we are concerned with the circumstances which make it possible for an author to capitalize upon the prospect of getting something for nothing from Uncle Sam. This leads to an oft-repeated phrase in President Truman's addresses to the effect that the government "welcomes" the opportunity to "do good" in this or that field of endeavor.

The cold fact is that Uncle Sam is spending millions for crazy services for which the only demand comes from people on the public payroll. Taxpayers do not want scores of services foisted upon them. —p. 54

* * *

GALVANIC CORROSION: Increasing use of combinations of dissimilar metals in the fabrication of modern products is causing manufacturers to consider carefully new problems of galvanic corrosion. Metals that are fairly close together in the galvanic series usually can be used in combination without much trouble, but if metals that are widely separated in the series are to be joined, one of them will be subjected to corrosion unless proper precautions are taken.

It happens that magnesium and aluminum and their alloys are near the corroded or anodic end of the galvanic series. If they are used in contact with copper, brass, nickel or other metals nearer to the protected or cathodic end of the galvanic series, special methods of fabrication must be employed to insure against galvanic action. Fortunately means of insulating many troublesome combinations of metals have been developed so that if the manufacturer heeds certain practical rules, he can master most problems of galvanic corrosion. —p. 82

Housing Starts Surprisingly High

A bulwark of the peacetime boom still shows strength. If 775,000 houses are started in 1951, civilian metal product output will have to be substantial

CONTROLS or no controls, CMP or no CMP—producers of strictly civilian metalworking products are going to do surprisingly well in 1951.

One factor that supports that statement is the sustained drive of new housing starts. New residential construction was a major buttress of the 1946-1950 peacetime boom, and still shows astonishing strength despite government curbs and materials shortages.

Consensus—Estimates among construction people on new nonfarm residential building starts in 1951 range from 700,000 to 850,000. STEEL picks the mean, 775,000, as its figure, far below the 1950, 1949 and 1948 starts (see the chart), but comparable or better than 1946 and 1947 performances. If 775,000 houses are started this year, the production of metalworking civilian items will have to be high because more than 4.5 tons of iron and steel products go into the average house. The metal is used in nails, hardware, furnace, radiators, hot water heating unit, water lines, laundry tubs, kitchen sink, bathtub, toilet, window frames, metal lath, conduit, flashing leaders, gutters and household appliances.

This year's housing starts promise to exceed by 10 per cent the 706,000 in 1941, the last prewar year in which there was anything near normal civilian production.

The Limits—Money and materials will force this year's starts below 800,000. If the sensational pace in the first 1951 quarter had been continued, we would have seen 1.2 million starts this year. But government curbs on financing have already slowed that rate, and materials shortages are beginning to slacken it still more. The materials scarcities will pinch the worst in the third quarter, normally the peak building period.

Housing starts for the year may even exceed the 1950 level in a few parts of the country—notably Texas, Colorado, southern Michigan and Missouri where expansion for defense is the most active. The government limits on $35,000 homes will have only minor affect on total starts because the bulk of all residential construction will cost $10,000 to $15,000 per unit.

More Time — Financing and materials difficulties mean that it's taking longer to build a house than formerly—about four months on the average. The larger contractors now often have two or three times as much money tied up in work in process than ever before in the postwar era. The larger operators generally have bought materials far in advance and hope to get by at least this year. The small contractors are already having trouble on all building items. Even the big builders are running into some snags on hardware, particularly door locks.

Hardware manufacturers are hard pressed for brass, bronze and zinc, and are substituting cast iron. Substitutions are a difficult matter in construction because of rigid and, in many cases, outmoded building codes. All producers of metal products for housing have much the same decision before them: Devote most of their limited output to their replacement market (which is usually bigger than their market from new construction) or allocate the builders the proportion, if not the physical volume, they usually get. Thus far, the decision has been to allocate on a historical proportionate basis. If that decision continues to hold, contractors believe they can start nearly 800,000 new houses this year.

For Defense: More Steel

By mid-year defense will take half of all the steel; in August it will take even more

HALF DEFENSE, half peace at the half-way point of 1951 is the way business is shaping up for the steel industry.

But it won't be a 50-50 matter very long, for defense is getting to be bigger business every day.

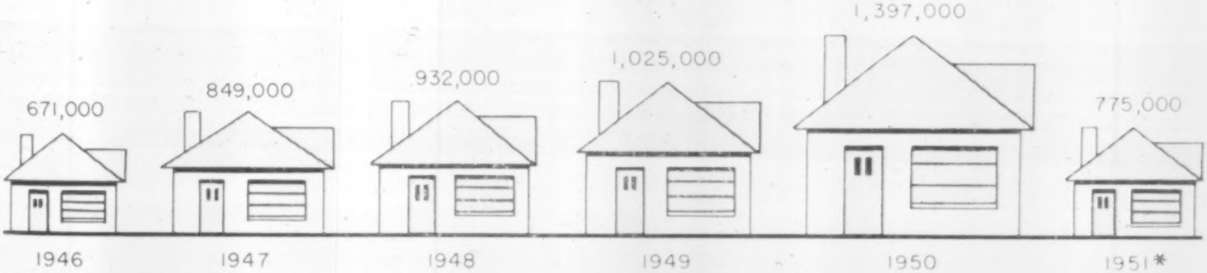
Set-asides of steel in July for defense and defense-supporting programs will take a little more than 50 per cent of the total output of ingots in July. A further increase in set-aside percentage in August is expected by NPA. The percentages of carbon steel products are of average monthly shipments from Jan. 1 to Aug. 31, 1950.

Percentages of iron and steel products to be set aside for July include: Blooms, billets and slabs, except projectile and shell quality, 52; wire rods, 60; heavy structural shapes, 68; steel piling, 68; hot-rolled bars, 45; reinforcing bars, 55; standard pipe, 30; oil country goods, 110; line pipe, 35; mechanical tubing, 45; pressure tubing, 70; low carbon drawn wire, 50; high carbon drawn wire, 60; hot-rolled sheets, 55; cold-rolled sheets, 40; galvanized sheets, 40; hot-rolled strip, 35; and cold-rolled strip, 35.

As to carbon plate, producers were instructed to set aside for July shipment 75 per cent.

Lead time for orders on July production of carbon-steel was reduced

Housing Starts—the 1951 Pace is Unexpectedly Swift
(nonfarm dwelling units)



*Estimated by STEEL. Source for other years, Labor Department from 45 days to 30 days.

To assure an orderly production and distribution of steel under the Controlled Materials Plan, NPA will establish a production directive system in its Iron & Steel Division. The division will balance the production of various steel products against the demand and issue directives requiring manufacture of the required forms.

Closed-End CMP: A Distinct Possibility

Right now it looks as if there won't be enough "free" steel, copper and aluminum left at the end of the fourth quarter after defense and defense-support programs get theirs

EVEN informed insiders in the National Production Authority now predict that the Controlled Materials Plan will control 100 per cent of steel, copper and aluminum by the end of the fourth quarter of 1951.

From the way the various programs are bulking, there will not long be enough "free" steel, copper and aluminum after defense and defense-support needs have been cared for to permit continuance of the open-end CMP now planned.

Too Much—Studies based on requests for CMP materials indicate that 35 per cent more steel will be asked for in the third quarter by claimant agencies than will be produced. The showing in copper and aluminum was even worse. So, considerable scaling down will be necessary. The military will get full requirements. The defense support programs will be handled variously—some will be cut, a few will be increased. Consumer durables will be cut further, and all other civilian consumers will get less steel. That will mean a host of new limitation orders. About 2 million tons of steel a month will be available for consumer durables in the third quarter, compared with 3 million tons a month before Korea.

Other nonrated consumers can count, roughly, on getting approximately 85 per cent of the steel in the first quarter that they got in the first period of 1951. They will get about 75 per cent of the aluminum that they received in the first 1951 quarter and about 80 per cent of the copper.

Make Ready—NPA Administrator Manly Fleischmann has laid down certain instructions to be followed in the interim period preceding adoption of the CMP. In addition to the requirements of the armed services and of some 35 or more directed defense-support programs for which steel will have to be supplied on an increasing scale in July, August and September, directives are to be issued whenever necessary to facilitate construction of hospitals, schools and churches. Of equal importance, directives are to be issued whenever necessary to supply materials and equipment for the great industrial expansion now underway.

Current thinking is: The quicker the new capacity is ready to go into operation, the quicker the period of materials controls can be terminated. Outlook, as seen by NPA officials, is that controls over materials need not be maintained much beyond the early summer of 1953, if the present expansion program goes through on schedule, and if we can pull through without an all-out war with Russia.

It's the Key to CMP

A Requirements Committee to review overall demands for steel, copper, aluminum and other critical materials and to recommend policies and programs for balancing supply with demand was formed by the Defense Production Administration.

This committee, which will recommend the amounts of materials to be allotted under the Controlled Materials Plan, has previously been operating informally through interagency meetings.

Charles E. Wampler, director of DPA's Office of Program and Requirements, was named chairman of the committee, and Melvin L. Anshen, assistant director of that office was appointed vice chairman. Other members of the committee will be announced later.

The Requirements Committee will be assisted by a Program Adjustment Committee. The vice chairman of the Requirements Committee was designated as chairman of the Program Adjustment Committee.

Findings as to the total supply of materials, products, facilities and other resources, and necessary proposals to bring supply and demand into balance will remain the initial job of the delegate agencies.

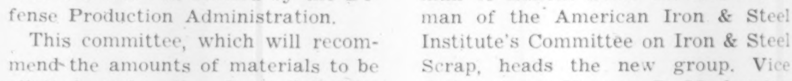
Scrap Group Formed

Trade associations form mobilization committee to meet growing shortage

MOBILIZATION Committee on Iron & Steel Scrap has been formed to help foundries and steel mills get 32.5 million gross tons of purchased scrap in 1951, 3 million tons more than needed in 1950.

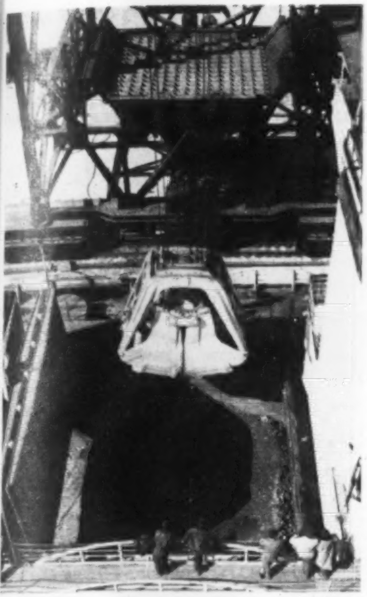
Representatives of the Gray Iron Founders Society, the Steel Founders Society of America, the Institute of Scrap Iron & Steel and the American Iron & Steel Institute sponsor the committee. Robert W. Wolcott, chairman of Lukens Steel Co. and chairman of the American Iron & Steel Institute's Committee on Iron & Steel Scrap, heads the new group. Vice chairmen are Herman D. Moskowitz, Schiavone-Bonomo Corp., and Max Kuniansky, Lynchburg Foundry Co.

Members—Other men serving on the new committee are: H. Hanfelder, Steel Founders Society of America; H. S. Faust, Gray Iron Founders Society; E. C. Barringer, Institute of



Wide World

FIRST AID FOR AIRSTRIPS: Worn, bent and pierced steel planking undergoes rehabilitation at an air base in Japan. Planks are run through power press and acid bath prior to repainting. Then they are bundled together and shipped to Korean bases for use in resurfacing airstrips used by U. N. warplanes



BUCKET UNLOADERS IN ACTION
. . . 15 tons at one gulp

Scrap Iron and Steel; Lowell D. Ryan, Malleable Founders Society; F. Kermit Donaldson, Steel Founders Society of America; Charles H. Lipsett, *Waste Trade Journal;* J. D. Sloan, Youngstown Sheet & Tube Co.; P. S. Killian, Bethlehem Steel Co.; L. D. Greene, American Iron & Steel Institute; F. J. Lasky, Republic Steel Corp.; W. W. MacMillen, National Malleable & Steel Casting Co.; and C. A. Ilgenfritz, U. S. Steel Co.

Virtually the same groups united in a similar joint scrap drive in 1947. The earlier committee's activities are given much credit for meeting the scrap shortage of four years ago. Mr. Wolcott says, "A large quantity of additional scrap can be recovered around industrial plants and farms by a well-organized drive."

Washington's Weight—Government backing of such a drive is indicated. National Production Authority last month started its own drive. It says governors of 28 states have agreed to sponsor scrap programs on state, county and municipal levels. Government agencies, particularly the Defense Department and the Maritime Commission, are being urged to assist by surveying their installations for heavy scrap. NPA has also put out a booklet, "Scrap for Steel for Defense," designed to help all types of industries speed the flow of scrap.

NPA Administrator Manly Fleischmann recommends that the head of every large industrial firm appoint a salvage committee empowered to: Search all properties for dormant scrap; survey potential wrecking and dismantling projects that will produce scrap; and make disposition of all production and dormant scrap as quickly as possible.

More Pig Iron: Scrap Answer

The only answer to the scrap shortage is more production of pig iron, L. S. Hamaker, assistant general manager of sales for Republic Steel Corp., told the Association of Sheet Metal Distributors meeting in Pittsburgh.

He says some steel plants throughout the country are operating with 4 to 6-day scrap inventories where formerly a 30-day supply was considered the minimum safe stock. Scrap will become shorter in supply since most of the scrap has been "combed out" of the country. Current manufacturing scrap and obsolete machinery are virtually the only two sources of supply that remain open.

Baltimore Ore Pier Opens

Boon to ore-hungry steel mills that rely on foreign supplies: Baltimore & Ohio Railroad Co.'s new $5 million pier in Baltimore, capable of handling 10 million tons of ore a year.

The bulk-handling facilities, built by Dravo Corp., Pittsburgh, can trans-load 2000 tons of ore per hour from ship to railroad cars. Ocean-going carriers of up to 40,000 tons can be accommodated.

B & O's 650-foot pier has two ore unloading machines mounted on movable towers. Buckets drop 15 tons of ore at one time into grill-topped bins that feed it onto an 1812-foot long conveyor belt, made by B. F. Goodrich Co. The ore travels 400 feet per minute to a scale house where it is weighed automatically and deposited in waiting railroad cars on tracks below.

Railroad yards with a capacity of 1800 cars support two pier operations.

Ore Vessels Ordered in England

English yards will build two new ships to carry Labrador-Quebec iron ore, says George M. Humphrey, president of M. A. Hanna Co., Cleveland.

The vessels, each of 30,000 tons capacity, will be 630 feet in length and will be delivered in the fall of 1955. Owner will be a newly formed company whose stockholders include Armco Steel Corp., Hanna Coal & Ore Corp., National Steel Corp., Wheeling Steel Corp. and Youngstown Sheet & Tube Co. Those firms are also stockholders in Iron Ore Co. of Canada which is developing the Labrador-Quebec ore properties. The new vessels will carry ore from the port of Sept Isle, Quebec, to Montreal, Philadelphia and Baltimore.

ORE MOVES TO WAITING CARS
. . . 2000 tons per hour

New Taconite Plant

Oliver breaks ground at Mountain Iron, Minn., for a 500,000-ton beneficiating facility

OLIVER Iron Mining Co., a U. S. Steel Corp. subsidiary, broke ground May 17 for a pilot taconite beneficiation plant at Mountain Iron, Minn. The facility will be in operation by the summer of 1952 and will have an annual capacity of 500,000 tons of finished concentrates.

Oliver's basic research in the beneficiation of magnetic and nonmagnetic taconites began about eight years ago when a research lab was established in Duluth. Preliminary work is now bearing fruit in a taconite development program that covers three stages.

First Step—The first stage was the intensive drilling of taconite formation to find the chemical and physical characteristics of the material, which are extremely variable. Findings resulting from that drilling helped govern the design and arrangement of the equipment for the pilot plant. Findings also determined that the low-grade ore available near Mountain Iron is best suited for pilot plant operation.

The second stage is the construction of the pilot beneficiation plant that will separate the fine particles of iron ore from the rock. That will be done by four steps of crushing, followed by two steps of grinding, after which the fine magnetic ore particles will be extracted from the waste materials by magnetic separators. Other equipment will separate the nonmagnetic iron from the silica with which it is associated. The recovered ore particles, of almost flour fineness, are "concentrates."

Number Three—Agglomeration, the third stage in the process, will transform the powdery iron ore into pieces about the size of eggs that can be charged into the blast furnace to produce iron. Oliver last year began construction of an experimental taconite agglomeration plant at Virginia, Minn., which will produce the egg-sized clinkers and nodules, from the concentrates made at Mountain Iron.

The Mountain Iron project will comprise the development of a taconite mine; the building of shops, offices and a crushing and beneficiating plant; a water supply system and power distribution lines and substations; waste disposal dumps; and other related facilities. The beneficiating plant will be equipped to handle 2 million tons of rock a year to produce 500,000 tons of concentrates.

More Machine Tools in Third Quarter Is NPA Aim

A STEP-UP in production of machine tools and related equipment during the third quarter of 1951 is the aim of new action by the National Production Authority.

It issued Order M-61, which authorizes use of a DO-75 priority rating by producers of machine tools and related equipment and specifies the maximum amounts of steel, copper and aluminum they can use that quarter.

In just about every case the maximum amount is as much or more than was used in the base period, the first three months of 1951.

NPA said it would help eligible purchasers of rated materials find sources of supplies.

After May 17 no purchases of materials and parts may be made by producers of machine tools and related equipment unless they use DO-75.

Products covered by the new order, M-61, and the percentages of the first quarter, 1951, usages of steel, copper and aluminum permitted in them in the third quarter of 1951 appear in the table below.

Permitted Materials Usage in Third Quarter, 1951

(in percentage of rate of first quarter, 1951)

Product	Iron and steel products	Copper products	Aluminum products
Boring and broaching machines	140	130	125
Drilling machines	140	130	125
Gear cutting and finishing machines	140	130	125
Grinding and polishing machines	140	130	125
Lathes	140	130	125
Milling machines	140	130	125
Other machine tools, except home workshop	140	130	125
Rolling mill machinery and equipment	140	130	125
Metalworking presses, except forging	140	130	125
Metalworking machinery not elsewhere classified	140	130	125
Jigs, fixtures, punches, dies, die sets and subpresses	140	130	125
Precision measuring tools (including production gages)	140	130	125
Metalworking accessories, not elsewhere classified	140	130	125
Foundry machinery and equipment	115	110	105
Industrial pumps	100	95	90
Compressors	105	100	95
Industrial fans and blowers	100	95	90
Electric industrial furnaces and ovens	110	105	100
Fuel-fired industrial furnaces and ovens	110	105	100
Industrial furnace and oven parts and attachments	110	105	100
Compressors and compressor units, refrigeration and air-conditioning	110	105	100
Condensing units, refrigeration and air-conditioning	110	105	100
Refrigeration and air-conditioning equipment, not elsewhere classified (except air conditioners, packaged, room)	110	105	100
Industrial patterns and molds	115	110	105
Electrical measuring instruments, not elsewhere classified	115	110	105
Integral horsepower motors and generators, under 2,000 kw	110	105	100
Motor-generator sets and other rotating equipment	110	105	100
Industrial electrical control equipment, except railroad and automotive	115	110	105
Resistance welders, components and electrodes	105	100	95
High frequency induction and dielectric heating apparatus	105	100	95

Components Get NPA Attention

Component parts production during the third quarter of 1951 will get special attention from the National Production Authority.

This government agency issued a new order, M-60, which specifies the maximum amounts of steel, copper and aluminum that can be used in the manufacture of a specific list of component parts.

The list consists of: Abrasive products (except abrasive wheels, diamond; metal abrasives). Files, rasps and file accessories. Hand saws, saw blades and saw accessories (except carpenters' saws, hand; compass saws, hand; coping saws, hand; miter saws, hand; pruning saws, hand; saw blades, hand; saw frames, hand; saw teeth, hand; saws, buck, hand; saws, crosscut, hand). Bolts, nuts and other industrial fasteners. Gas welding rods. Cutting tools for machine tools and metalworking machinery. Speed reducers, gears and industrial high speed drives. Mechanical power transmission equipment, not elsewhere classified. Valves and fittings for piping systems, except plumbing. Ball and roller bearings and components. Fractional horsepower motors. Arc welding electrodes.

Permitted to be used in those products during the third quarter are the following percentages of base period materials consumption: Iron and steel, 105; copper, 100; and aluminum 95. Base period is the first three months of 1951.

To get the needed materials, a DO-70 priority rating must be used. Ordering of such materials after May 17 without the use of DO-70 rating is prohibited.

The coming Controlled Materials Plan establishes priorities for components makers to use in procuring materials but NPA considered Order M-60 necessary to bridge the gap until CMP reaches its full effectiveness.

Guide for Small Businessmen

Things every small businessman should know are wrapped up in a 31-page booklet just issued by the Defense Production Administration. Its title: "Mobilization Guide for Small Business."

Contained in the guidebook is such information as: How to be placed on government bid lists; methods of financing plant construction; how to appeal for hardship relief from controls and regulations; and means of getting help in obtaining needed machinery and other kinds of operating supplies.

There's much other helpful information too.

The guidebook is available at all field offices of the Department of Commerce.

IFMA in Uniform

Industrial furnace makers' output to total $60 million, 80 per cent for defense

INDUSTRIAL furnace builders already have mobilized 80 per cent of their productive capacity for defense compared with 20 per cent for the entire national economy, Henry M. Heyn, Surface Combustion Corp., Toledo, O., and outgoing president of the Industrial Furnace Manufacturers Association reported at the group's 21st annual meeting in Hot Springs, Va., May 14-16.

Going Up—This year furnace builders will turn out $60 million worth of equipment, next year $90 million worth, Mr. Heyn estimates. If total war comes, Mr. Heyn thinks requirements could readily total as much as $500 million. Current order backlog is over $60 million.

C. B. KENTNOR JR.
. . . elected IFMA president

C. B. Kentnor Jr., W. S. Rockwell Co., Fairfield, Conn., and newly elected IFMA president sees little business coming from Europe even under the U. S. military assistance program providing for armament plans ranging from Norway to Turkey. This is due to the dollar shortage and the availability of equipment in Europe, he said.

Materials Relief on Way—Furnace men expect to get relief on materials under the nickel allocation program June 1 and under the Controlled Materials Plan 30 days later. This is for the reason industrial furnaces are a key link in the armament program. Newer materials to be heat-treated range from 16-25-6 chrome-nickel-molybdenum high temperature alloy to magnesium-zirconium alloys for aircraft structures.

Nickel in the form of nickel-chrome castings and strip and wire heating elements actually is the controlling material in constructing furnaces. Nickel requirements this year are expected to be 5 million pounds and each furnace builder has been advised to specify the amount needed each quarter in letters accompanying CMP applications for controlled materials (steel, aluminum, copper).

Another current problem is figuring of prices under CPR 30, particularly special furnaces or those erected in the field, and a 30-day extension of the May 28 effective date has been requested.

J. J. Walker, C. I. Hayes Inc., Providence, R. I., was elected vice president. New directors are: J. H. Sands, Eclipse Fuel Engineering Co., Rockford, Ill.; T. H. Wickwire III, Trent Inc., Philadelphia; and K. H. Huppert, K. H. Huppert Co., Chicago.

Small Producers Covered

Small manufacturers who make products covered by Ceiling Price Regulation 30 (Machinery and Related Manufactured Goods) are subject to this regulation.

OPS spokesmen point out that CPR 22, in Section 1, contained a provision that manufacturers whose gross sales in the last fiscal year were less than $250,000 might elect not to use CPR 22, but could stay under the General Ceiling Price Regulation of Jan. 26 if they elected. This privilege was not carried along into CPR 30. Regardless of what your gross sales were you are covered by CPR 30 if you make commodities covered by that order.

K-F Buys Stock in Chase Aircraft

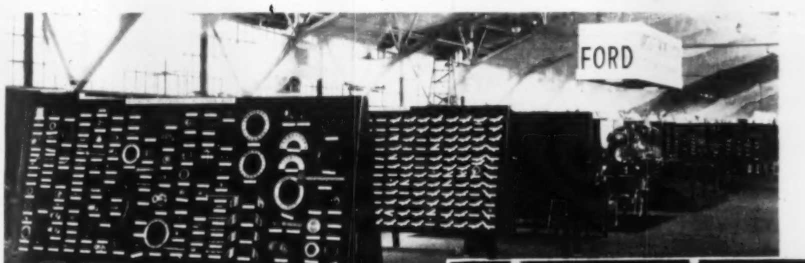
Kaiser-Frazer Corp. has acquired 49 per cent of Chase Aircraft Co., Trenton, N. J.

K-F President Edgar Kaiser becomes president of Chase. Michael Stroukoff, former president, will become executive vice president of Chase and chief engineer in charge of research and development. Chase specializes in glider design.

Converters May Get More Steel

More steel for conversion mills may be on the way.

The Steel Products Industry Advisory Committee recommended that



COME AND GET IT: Business is laid out for subcontractors to gobble at the Mid-Central Air Procurement District's Air Force Exhibit in Chicago. The open house, boasting 86 exhibitors, gave prospective suppliers a chance to examine and ask questions about needed parts and assemblies. Facilities for precision work were most in demand. A few prime contractors were able to make deals at the show. But more important, the door was opened to negotiations of many more contracts. More than 10,000 attended

NPA's basic steel order M-1 be amended to assure converters a minimum tonnage of 90 per cent per month of their average monthly consumption during the period from Jan. 1, 1950, to Sept. 30, 1950.

NPA indicated that such an amendment already is under consideration for relief of converters.

New Coke Ovens at St. Louis

Great Lakes Carbon Corp. has started construction on 40 new coke ovens at its merchant coke plant in St. Louis.

The ovens will increase the capacity of the plant by about 75 per cent when they start operation in the summer of 1952. Like the present ovens, the units under construction will be specially built for the production of high grade foundry and industrial coke. Along with the increased output of coke at the St. Louis plant will come an equivalent increase in all foundry coke products.

Aircraft Steel Directive Issued

To insure an adequate supply of alloy steel products to manufacturers of military aircraft, NPA's Iron and Steel Division has issued an informal directive to producers of those products to replenish the stocks of warehouse companies which specialize in them.

The warehouse companies, about 25 in number, with stocks in some 40 cities, are pledged to sell those aircraft alloy steels only to consumers who will use them in building aircraft for the armed services. The directive applies to electric furnace alloy steels of aircraft specifications, in the form of bars, sheets, strip and tubing. Stainless steel products are not included. Specifically, the directive calls on the mills to complete shipment by Sept. 30 against orders for such steels, whether rated or unrated, which had been placed by these warehouses with the mills on or before Mar. 31.

Farm Equipment Plants Helped

Farm equipment manufacturers received help for their July, August and September production from the National Production Authority.

To give this help, NPA issued Order M-55A, which, subject to minor qualifications: 1. Permits production of farm equipment during the third quarter of 1951 at a rate similar to production in the corresponding period of 1949; and 2. authorizes farm equipment makers to use a defense order rating DO-87 to obtain steel, copper, aluminum, zinc and components needed during that quarter.

Under NPA Order M-55, issued Mar. 31, farm equipment manufacturers were provided priority assistance for June, 1951, production only.

The new order gives farm equipment makers these alternatives to determine permitted production during the third quarter of 1951: 25 per cent of total production during July, 1949, to June, 1950, or the amount actually produced during the third quarter of 1949, whichever is greater.

The ABC's of CMP

If you're trying to know the CMP from A to Z you might find it helpful to get the NPA's new booklet "ABC's of CMP."

It's a brief, nontechnical outline of the principles and operating procedures of the Controlled Materials Plan, which becomes operative July 1.

Copies of the booklet are available free from the National Production Authority in Washington and from Commerce Department field offices.

STEEL's Weekly Summary of Subcontract Opportunities

OPPORTUNITIES to enter defense work in the role of subcontractor continue to increase for any company having facilities and know-how to supply the growing needs of electronics and aircraft manufacturers.

That the demand will continue to increase is illustrated by new commitments for companies in both fields. Transducer Corp., Boston, has a "letter of intent" contract for $18 million from the Air Force to make radar training equipment which simulates use of radar and enables ground training of personnel. This is only the first of several similar Air Force orders, reports M. G. Stratton, Transducer president. West Coast electronics subcontractors may have opportunity to supply parts to General Electric Co.'s Pasco, Wash., plant where production begins in July on station service control boards, main control boards and generator control cubicles under a $450,000 contract with the Corps of Engineers.

Goodyear Aircraft Corp., Akron, has a multi-million dollar contract to make wing and empennage assemblies for North American Aviation Corp.'s T-28 advanced trainer. Production will take place in Goodyear's Litchfield Park plant in Phoenix, Ariz. Landing gears for the Fairchild Packet cargo plane will be assembled by Willys-Overland Motors Inc. in 432,000 square feet of its Toledo, O., plant under an initial Air Force award exceeding $3 million.

Other contracts, of interest to the metalworking industry, follow:

PRODUCT	CONTRACTOR
Radio Transmitters (signal corps)	Wickes Engineering & Construction Co., Camden, N. J.
Radiosonde Transmitters	Molded Insulation Co. Inc., Philadelphia.
Radio Control Receivers (naval aeronautics)	Radioplane Co., Van Nuys, Calif.
Radio Receiving Sets	David Borgen Co. Inc., New York Collins Radio Co., Cedar Rapids, Iowa
Radio Sets	Hallicrafters Co., Chicago
Micro-Switches	Micro-switch Div., Minneapolis-Honeywell Regulator Co. Freeport, Ill.
Crystal Impedance Meters	Radio Frequency Laboratories Inc., Boonton, N. J.
Frequency Shift Keyer Equipment	Northern Radio Co. Inc., New York
Recorder Reproducers	Telectro Industries Corp., Long Island City, N. Y. Daystrom Electric Corp., Poughkeepsie, N. Y.
Starters	Jack & Heintz Precision Industries Inc., Cleveland
Jato Assist Take-off Units	Jato Div., General Tire & Rubber Co., Azusa, Calif.
Motors (26v, D.C.)	Air Associates Inc., Teterboro, N. J.
Motors (24v, D.C.)	Airesearch Mfg. Co., Los Angeles
Portable Testers (voltmeters)	Rumsey Electric Co., Philadelphia
Actuator Motors	Electrical Engineering & Mfg. Co., Los Angeles
Carburetor Assemblies	Bendix Products Div., Bendix Aviation Corp., South Bend, Ind.
Valves (globe composition)	Hydro-Aire Inc., Burbank, Calif. Walworth Co., New York Northern Indiana Brass Co., Elkhart, Ind.
Fork & Strut Assemblies	Cleveland Pneumatic Tool Co., Cleveland
Carrier Telegraph Transmitters (naval)	C.G.S. Laboratories Inc., Stamford, Conn.
Steering Gear	Hyde Windlass Co., Bath, Me.
Main Propulsion Turbines	Commercial Testing & Engineering Co., Chicago
Auxiliary Power Units	Waukesha Motor Co., Waukesha, Wis.
Depth Charge Arbors (ordnance)	Cameron Iron Works Inc., Houston
Practice Depth Charges	New Haven Clock & Watch Co., New Haven, Conn.
Fuse Containers	National Can Corp., New York Melvina Can Co., Maspeth, New York
Boosters (metal parts)	Borg Products Div., Geo. W. Borg Corp., Delavan, Wis. Northwest Automatic Products Corp., Minneapolis
Sewing Machines (motor driven)	Singer Sewing Machine Co., New York
Trailers (¾ ton)	Linn Coach & Truck Div., Great American Industries Inc. Oneonta, N. Y.
Tractors	Frank G. Hough Co., Libertyville, Ill.
Snow Plows	Burch Corp., Crestline, O.
Scrapers	Bucyrus-Erie Co., S. Milwaukee, Wis.
Cranes	Bay City Shovels Inc., Bay City, Mich.
Asphalt Heaters (trailer mounted)	Cleaver-Brooks Co., Milwaukee
Hydraulic Jacks	Templeton, Kenly & Co., Chicago
Compressors (portable piston type)	DeVilbiss Co., Toledo, O.
Portable Generators (engine driven)	Winpower Mfg. Co., Newton, Iowa D. W. Onan & Sons, Minneapolis
Semi-trailers (mobile dental units)	Linn Coach & Truck Div., Great American Industries Inc. Oneonta, N. Y.
Ambulances (¾ ton)	Henney Motor Co. Inc., Freeport, Ill.
Pump Assemblies	Eureka Williams Corp., Bloomington, Ill.
Shell Fin Assemblies	Madison-Kipp Corp., Madison, Wis.
Generators (air materiel command)	Eicor Inc., Chicago
Rotary Launchers	Radioplane Co., Van Nuys, Calif.
Panel Trainers	Technical Training Aids Inc., Tulsa, Okla.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to U.S. Commerce Department, Division of Printing Services, attention E. E. Vivian, Room 6225, Commerce Bldg., Washington 25. For ESA orders, write J. L. Miller, Economic Stabilization Agency, Room H367, Temporary E Bldg., Washington 25.

Materials Orders

HIDES—Amendment of May 11, 1951, of NPA Order M-35 (cattlehides, calfskins and kips) defines "practicable minimum working inventory" and stipulates that defense order ratings cannot be used to obtain cattlehides, calfskins and kips. Amendment effective May 11, 1951.

COLUMBIUM, TANTALUM—Amendment of May 11, 1951, of NPA Order M-3 increases the flexibility in the restrictions on the use of columbium and tantalum in steel production. Amendment effective May 11, 1951.

CONSTRUCTION—Amendment of May 11, 1951, of NPA Order M-4 does these things: (1) Exempts the construction of industrial plants, facilities or factories for which a certificate of necessity has been issued from all restrictions of Order M-4; (2) grants a specific small job exemption to permit construction of additions, improvements or modernization of industrial plants, factories or other facilities where the total steel used will not exceed 25 tons; and (3) makes unmistakable the application of M-4 restrictions placed upon the construction of gymnasiums; printing, duplicating and publishing establishments; and facilities for storage, distribution, display or sale of consumer goods. Amendment effective May 11, 1951.

SERIALIZATION — Amendment of May 10, 1951, of the Defense Minerals Administration Order MO-7 makes it easier for the small operator to apply for an identification or serial number for his mine, smelter or mineral processing plant for use in obtaining priorities or allocations of machinery, equipment and supplies.

POLYETHYLENE — Schedule 5 to NPA Order M-45 puts polyethylene under NPA allocation beginning June 1, 1951. Schedule 5 was issued May 11, 1951.

RESORCINOL — Schedule 6 to NPA Order M-45 puts resorcinol under NPA allocation beginning June 1, 1951. Schedule 6 was issued May 11, 1951.

FARM EQUIPMENT—NPA Order M-55A issued May 11, 1951, permits production of farm equipment during the third quarter of 1951 at a rate similar to production in the corresponding period of 1949 and authorizes farm equipment manufacturers to use a defense order (DO) rating to obtain steel, copper, aluminum, zinc and components needed during the third quarter.

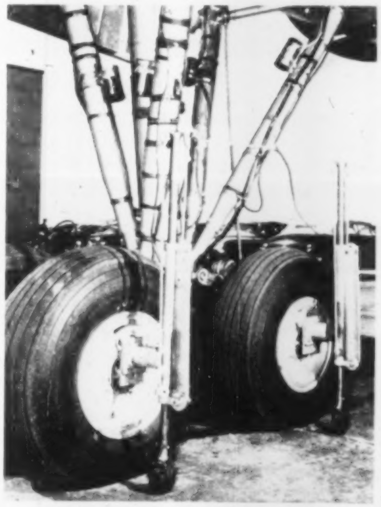
COMPONENTS—NPA Order M-60 issued May 14, 1951, is designed to assure an adequate supply of materials during the third quarter of 1951 for the manufacture of component parts. It specifies a rate of production and provides a DO-70 priority rating to producers to enable them to get materials needed to produce them. The order is an interim measure to bridge the gap until the Controlled Materials Plan reaches its full effectiveness.

MACHINE TOOLS—NPA Order M-61 issued May 14, 1951, specifies minimum essential goals for production of machine tools and related equipment and grants producers of them a DO-75 priority rating to obtain materials for third quarter production.

HIDES—NPA Order M-62 issued May 15, 1951, and effective that date places restrictions on processing of certain hides and skins.

DEERSKINS—Amendment of May 15, 1951, of NPA Order M-29 alters the order so it now relates only to deerskins. Amendment effective May 15, 1951.

SOFTWOOD PLYWOOD—NPA Order M-63 issued May 16, 1951, and effective that date instructs makers of softwood plywood to set aside each month 20 per cent of their average monthly production, figured on base period output, as a reserve from which to fill defense-rated (DO) orders.



FILMING A FOOTPRINT: This experimental tandem-type landing gear, designed to improve landings on rough or soft-surfaced fields, undergoes flight tests on a Fairchild C-119 Packet. Strain gages, mounted on the gear's struts and oleo, and recording oscilloscopes maintain a running record of the loads sustained by the gear on unprepared fields

Price Regulations

IMPORTS—Amendment 1 of Ceiling Price Regulation 31 gives importers the option of extending the effective date of CPR 31 to June 1, 1951. Effective date of CPR 31 originally had been May 9, 1951, but it was found that many importers were unable to determine their ceiling prices under that regulation by that date. Sellers who file the required pricing data before the new effective date of June 1, 1951, may start pricing under CPR 31 at the time of such filing.

LOSSES—General Overriding Regulation 10 issued May 11, 1951, by Office of Price Stabilization and effective that date provides adjustment procedures for manufacturers operating at an overall loss because of a ceiling price imposed by any OPS regulations.

SERVICE TRADES — Ceiling Price Regulation 34 issued May 11, 1951, by Office of Price Stabilization places commercial and personal services under a ceiling price regulation separate from the general price freeze of Jan. 26, 1951. CPR 34 was effective May 16, 1951.

USED STEEL DRUMS—Ceiling Price Regulation 36 issued May 11, 1951 by Office of Price Stabilization establishes specific ceiling prices for certain used steel drums, raw and reconditioned, and for the services of reconditioning and lining such drums. CPR 36 was effective May 16, 1951.

U. S. TERRITORIES—Amendment 2 of Ceiling Price Regulation 9 tightens the Office of Price Stabilization ceiling price regulation dealing with commodities sold in U. S. territories and possessions but not produced there. Amendment 2, effective May 21, 1951, changes the regulation to exempt only commodities which are specifically exempted by the Defense Production Act of 1950.

NPA Delegation

Authority delegated to the secretary of the interior by NPA Delegations 5 and 1 with respect to the manufacture and distribution of mining machinery and equipment was revested in the secretary of commerce. NPA will establish a separate mining machinery and equipment division within the industrial and agricultural equipment bureau. The change was made to meet administrative problems and to facilitate operations under the Controlled Materials Plan.

PAD Delegation

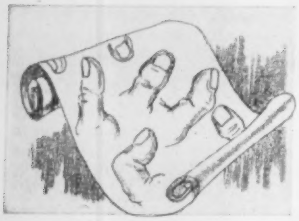
The Petroleum Administration for Defense, Department of the Interior, delegated authority over distribution of petroleum coke to the administrator of the Defense Solid Fuels Administration, Department of the Interior. Delegation took effect May 14, 1951.

DSFA Delegation

COAL CHEMICALS — Defense Solid Fuels Administration Delegation 1 issued May 2, 1951, delegates to the secretary of commerce all functions delegated to the secretary of the interior by Defense Production Administration Delegation 1 with respect to distribution of coal chemicals produced as by-products of coke made from coal.

Windows of Washington

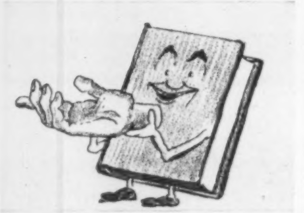
By E. C. KREUTZBERG *Washington Editor*



U. S. POLICY: ALL THUMBS
. . . and there are gripes

SUBSTITUTE

BAD WORD
. . . say alternate materials



HELPING HAND
. . . from a new book

CONFIDENTIAL REPORTS
. . . now released

WASHINGTON is in one of those recurring periods when everybody in and out of the government is disgruntled. Biggest gripe, of course, is over foreign policy. Your friends in the important defense agencies put it succinctly: "We're all dressed up and have no place to go."

Another gripe is on the matter of the expansion of industrial capacity. Congress voted fast amortization to encourage a big industrial expansion. Everyone in government has been breaking his neck to get such expansion. Inevitably now come congressional investigations. Manly Fleischmann was forced to spend several days defending the certificates of necessity that have been granted and making clear that amortization and government loans do not necessarily mean the gifting of public funds or the encouragement of monopoly.

The biggest gripe among industry men is over the failure of politicians to understand that there are materials shortages. Congressmen conduct investigations to ascertain whether shortages are unnecessary and whether small business is suffering a disproportionate share of the discomfort from shortages. Congressmen keep bombarding NPA with complaints from angry businessmen who cannot get all the materials they want. So Manly Fleischmann goes up onto the Hill to explain how every care is taken to assure everyone a fair shake.

Not long ago Victor Wickersham (Dem., Okla.) sent out thousands of letters to farmers, farm implement manufacturers, food processing concerns and the like to ascertain how much agriculture as a whole is suffering from shortages of steel and machinery. He says food is the first line of defense; agriculture must not be neglected as in World War II.

Naturally the materials men in NPA expect nothing but more migraine attacks from his investigation.

Boiling Down to Nothing . . .

Now in progress in NPA is a controversy between government and industry contingents about "good" and "bad" words. "Substitute" is a "bad" word that denotes cheap ersatz materials.

A better word is "alternate" materials. "Scarce" materials is bad psychologically; it is better to talk about "relative criticality." "Limitation" is "bad" when used to describe NPA orders reducing the use of materials for given products; it conveys a sense of deprivation. Better to talk about "relative availability" or something like that.

Industry men say: "Nuts! What we need is somebody with guts enough to tell people they can't have materials."

Released from 'Confidential' . . .

One of the important classified reports of the World War II War Metallurgy Committee, of which 100 copies were made for official use, now is being released to the general public and industry for the first time.

It was originally prepared by E. M. Wise (he's with International Nickel Co. now) and dealt with the use of metals in electrical contacts—particularly with the substitutability of metals and alloys for different types and requirements of electrical contacts. It dealt with such factors as contact failure, protective circuits, critical current, arcing, chemical phenomena, troubles due to dust, oil and organic vapors, and the useful effects of oxides. Separate sections dealt with the characteristics and principal uses of all typical contact materials: Carbon and graphite, copper, silver, platinum, tungsten, mercury, gold, molybdenum, palladium, iridium, rhodium, ruthenium, osmium and nickel.

Released from its former "confidential" status, the report has been reprinted by the International Nickel Co. for the information of interested industry. A limited number of copies are available free of charge from the Office of Technical Services, Commerce Department, Washington 25; requests to the OTS should ask for copies of Y-1.

For Your Bookshelf . . .

So diversified are the services available from Washington that the average citizen is sure to benefit from reading the new book entitled "How to Get It from the Government." Prepared by Stacy V. Jones, an experienced Washington correspondent, and published by E. P. Dutton & Co. Inc., the book is on sale at news stands at $1.50. It explains how to get personal help under the social security system, how a farmer can get various types of assistance, the help of many kinds open to a veteran, how to get government loans, how to get land and business property from the government, the types of assistance that are available to small business, the many different helpful government publications, and what your congressman is prepared to do for you. A handy book for those interested in what government does for them.

Kerber Succeeds Ewing . . .

Sam Ewing, on leave from Youngstown Steel & Alloy Corp., was selected to serve as assistant director, Industrial Materials & Manufactured Goods Division, Office of Price Stabilization. William Kerber, Hanna Furnace Corp., who has handled ore and pig iron pricing problems, succeeded Mr. Ewing as chief of the Metals Branch.

CPR on Warehouse Stocks . . .

Ceiling price regulation on iron and steel out of warehouse stocks is being readied for early announcement. Shortly thereafter the castings price order will be issued.

Wurlitzer Contracts . . .

Army Signal, Ordnance and Quartermaster Corps and the Air Force all have prime contracts placed with the Wurlitzer Co., Chicago,—a $10 million defense total.

Transportation: Not Quite Enough

We need more freight cars, better roads and a more comprehensive government policy toward all transport forms to have the system adequate for defense needs

WHERE are we going in transportation? A STEEL survey shows that the nation's railroads, trucks, Great Lakes freighters and other inland waterway facilities, pipelines and airlines are not quite ready to handle the added freight burdens of a defense economy.

Threatened, then, are more freight tieups as we move closer to a garrison state. Defense Transport Administration believes that the worst is yet to come. Movements of goods have been heavy, but not at the anticipated peak, yet already there have been stresses and strains, particularly in rail transportation. More than 1023 billion ton-miles were hauled in 1950 intercity freight (see the table). Transportation Association of America estimates that at least 1080 billion ton-miles will be carried in 1951. That's 8 billion more than were hauled at the wartime peak in 1944 when transport groaned with 1072 billion ton-miles.

Close, but Far—We are close to adequate carrying capacity, but still far enough away that the discrepancy may mean costly snags in the months ahead. What to do? People close to the problem say action must be taken on four fundamental difficulties in the transportation industry.

1. We must give the various forms of transportation the moving facilities to do the job—freight cars and locomotives for railroads, trucks and trailers for motor transport, ships and barges for inland waterway carriers, pipe for pipeline companies and cargo planes for airlines. With the exception of cargo planes, the added physical means are just beginning to be produced, by means of government help in steel and other allocations.

2. We must give the railroads, trucking companies and inland waterway carriers adequate fixed facilities to perform their services. Fixed facilities of the railroads are in excellent shape; nor do inland waterways and docks need extensive repair and modernization. But the roads are in bad condition, and continued neglect will peril motor transport. A glance at the accompanying table will show the increasing importance of trucks in the transportation picture.

3. Transportation men must remove a psychological block. Few of them, says DTA, seem to realize that their industry "faces the roughest task in its history." They argue: We handled the traffic in World War II; we can do it again. That's true about World War II, but the situation now is different and in many ways more difficult. In the early 1940s, we were allout for war, working seven days a week with a minimum of peace production. Then, we were like a juggler throwing one heavy club in the air. Now, we must keep two clubs going—civilian and defense production—each lighter than the one in World War II, but together a little heavier.

4. STEEL finds that the consensus among transport men and shippers is that the need grows for comprehensive government treatment of all the transportation system. Because nearly a dozen different agencies are now dealing with various phases of transport, the legislative and administrative action from Washington affecting the system is patchy and inadequate. Establishment of DTA is a move in the right direction, but that agency is temporary and has jurisdiction over railroads, motor transport and inland waterways only—not over pipelines and air freight.

Partial Answer—Difficulty No. 1 is well along toward solution. Difficulty No. 3 should gradually solve itself. The answers to Nos. 2 and 4 can't be found on any short-term basis. With just half the basic problems solved, will we get by for a while? Consensus: We'll manage to limp along that way for a year or two, but if we are committed to a struggle with the Communists lasting a decade or longer, we must answer Nos. 2 and 4 or we'll eventually suffer a major transportation breakdown.

Those four basic problems aren't the only questions plaguing transportation, but they're the most general. Here is the specific situation for each type of transportation:

STEEL
Transportation
HUB OF DEFENSE

A machine gun sitting in Ohio won't do an infantryman in Korea much good. So, transportation is the hub of our defense. A STEEL survey shows that that hub has several weaknesses that could make useless much of America's vaunted productive capacity.

Money, Materials: Rail Aches

The railroads' problems are money and materials.

The roads will spend $1250 million in 1951 on capital improvements, 25 per cent more than the yearly average from 1946 through 1950. Of the $5 billion spent in those five years, $1.5 billion was for freight cars, $1.5 billion for locomotives and $2 billion for fixed facilities. This year the largest sum will go for freight cars.

Estimated Intercity Freight Haulage

(By all forms of transportation; in billions of ton-miles)

YEAR	RAIL WAYS	MOTOR TRUCKS	GREAT LAKES	INLAND WATERWAYS	PIPE LINES	AIR LINES
1939	335	43	76	20	65	———
1940	375	51	96	22	64	———
1941	477	57	114	27	78	———
1942	641	50	122	26	75	———
1943	730	48	116	26	96	———
1944	741	49	119	31	132	———
1945	684	56	113	30	123	0.001
1946	595	64	96	28	93	0.01
1947	658	78	112	35	104	0.04
1948	641	88	119	40	119	0.07
1949	529	94	97	42	110	0.09
1950	605	115	119	46	138	0.14
Per Cent of Total Ton-Miles						
1939	62.1	8.0	14.1	3.7	12.1	0
1950	59.1	11.2	11.6	4.5	13.5	0.01

Based on Interstate Commerce Commission figures, as modified by American Waterways Operators Inc., except for air line figures developed by Air Cargo Inc. 1950 ton-miles and percentages estimated by STEEL. Airlines figures include air freight only, not air express. All figures exclude baggage and mail.

proportionally less will be allotted locomotives and about the same sum as usual will go on tracks and other fixed assets.

Three Times — Railroad operating expenses have more than tripled since 1939. Calculated on the basis of the increase in rail revenue from 1 ton of freight hauled 1 mile, rail rates have gone up only 40 per cent since 1939. Calculated on the cumulative percentage increases granted since 1939, rail freight rates have increased 61 per cent since that year.

Despite the financial problems, the railroads are not yet having trouble financing their capital equipment programs. That's because railroad volume looks good for years to come—the roads will haul an estimated 7.4 per cent more ton-miles in 1951 than in 1950—and banks are willing to finance purchases.

Costly Slump—Largely because of a 1949 slump in freight car ordering, the railroads now are desperately short of freight cars. For the week ending Apr. 28, 9404 more cars were ordered each day by shippers than the roads could deliver. The freight car builders, with the help of steel allocations, are gradually boosting production and in June may turn out their quota of 10,000 cars a month. But even so, it will be a long time before the Class I railroads get their goal of 1,850,000 cars. As of Apr. 1, they had 1,717,039 cars in use, compared with 1,794,000 in 1944.

Although 10,000 cars will be built a month for the remainder of the year, and some 100,000 new units will be added to the fleet in all of 1951, about 5000 cars a month are being scrapped. So the net gain this year will be only about 40,000 cars, and the fleet goal won't be achieved until sometime in 1953.

Still Strong—The table on p. 57 shows that railroads are slipping a little, but that they still haul more intercity freight than all other forms of transportation combined. Intercity rail ton-mileage in 1950 was 180 per cent greater than in 1939. The railroads are more than holding their own on bulk freight—products of mines account for 39 per cent of the total traffic. Iron and steel products are another major classification; more than 100 million tons went by rail in 1950.

The railroads claim that two government rulings would help them considerably in meeting transportation demands: Re-enactment of heavy loading orders of World War II which would force shippers to load cars to maximum capacity and a return to the seven-day week in industry so that railroads would not lose part of their freight car capacity on weekends. Washington will enact neither order. A heavy loading order would do little good now because the reform in habits affected by World War II rulings has lasted, and there's little slack to be taken up. In 1950, 31.4 tons were loaded per freight car, compared with 32.7 tons in 1944 and 28.5 tons in 1941. The seven-day week is impractical because of materials and labor shortages.

But there are three steps which shippers can take that will help railroads: Prompt loading and unloading, clean unloading and careful packing. Shippers lost $85 million worth of freight through damage and theft in 1950. Some of that could have been avoided.

GOOD SHAPE FOR RAILS
. . . but not so for cars

Trucking Recognized

The motor transport industry needs 418,000 new medium trucks and 200,000 new trailers. Prospects are good that the industry will get its equipment. In World War II, the government cut off truck production for a time and soon learned of its near-disastrous mistake. That error won't be repeated, for as the p. 57 table indicates trucks are gaining rapidly in the transportation picture. Trailers are under the B list of the Controlled Materials Plan.

A Lot of Trucks—There are 8.6 million trucks on the road today and more than 400,000 trailers. Of the trucks, 4.7 million are private vehicles other than farm units, 2.5 million are farm trucks, 1.1 million are for-hire vehicles both in intercity and local traffic, 300,000 are publicly owned.

The average truck in 1941 was 5.6 years old; 7 years in 1950. The age is rising because trucks are being kept in service longer to meet rising demands for motor transport. About 1 million trucks are being built a year, says American Trucking Association, and the net addition to the fleet after subtracting vehicles scrapped is surprisingly high—745,000 in 1948, 474,000 in 1949, 436,000 in 1950. Net additions in 1951 will not be so high, because an estimated 800,000 will be junked, compared with 763,000 in 1950. By 1960 there may be 30 per cent more trucks on the road than there are now.

More Trailers—Truck-Trailer Manufacturers Association is campaigning to get materials to build 90,000 trailers a year. About 64 producers turn out 94 per cent of all the production. Limiting materials are alloy steel bars and other items used in axle output.

The status of the motor transport industry's moving facilities is good; the status of fixed facilities—roads—is bad, worse than for any other form of transportation. There are 38,000 miles of main highways connecting the main U. S. cities. Of that 38,000, 7000 miles exist in which it isn't safe to pass another car. There are 3.1 million miles of roads in the U. S. altogether. In 1948 a government study reported that $11.3 billion was needed to expand and repair roads in a 20-year plan. Scarcely a start has yet been made on implementing that program.

Roads: The Answer — Although a comprehensive road building program is the solution to most of the trucking industry's problems, that remedy is a long way off. To improve motor transport service immediately, shippers can help by building better docks and by better scheduling of shipping and docking facilities.

Water Carriers Ready

By 1952, inland waterway carriers on both the Great Lakes and the river systems will be equipped to handle all, or nearly all, the freight required.

Sixteen Great Lakes freighters now are or soon will be constructed for American owners and two for Canadian. More than half will be operating by 1952; all by 1953. Some 264 vessels are now in the Lakes ore trade alone, the major commodity by tonnage. Other principal bulk shipments are in coal, grain and oil.

Barging Ahead—The situation on the rivers is improving because about 700 self-propelled vessels and barges were built in 1950; about 600 more will be launched in 1951. American Waterways Operators Inc. believes that government allocations for the barge-building program are now adequate. On the U.S. rivers and lakes

In 1949, there were about 4032 towing vessels, 11,132 barges with a capacity of 7,758,576 tons and 2086 tank barges with a capacity of 2,543,668 tons.

The importance of water carriers is obscured because the bulk of their tonnage is raw materials that directly affect only a limited number of shippers. Although 750,000 cars and trucks were transported by rivers in 1950, nearly 90 per cent of the inland other then Great Lakes carriers' traffic last year was coal, oil, grain, sulphur, salt, chemicals, acids, fluorspar, sand, gravel, steel (particularly pipe for the oil fields), sugar and coffee.

Transport by Pipe

A surprisingly large factor in the transportation picture are pipelines. American Gas Association estimates that 375,000 miles of gas lines are under ground. American Petroleum Institute says about 153,000 miles of crude oil and oil products lines exist.

Approved orders and pending certificates call for construction of 12,800 more miles of gas lines this year. At least another 5000 miles of oil line will be laid in 1951.

Fast Race—Even so, the gas and oil industries will need every foot of pipe they can get to stay with rising needs. J. E. Goble, president of National Tube Co., a U. S. Steel Corp. subsidiary, points out that natural gas sales increased 121 per cent from 1940 to 1950. The petroleum industry had a daily capacity of 5,250,000 barrels of crude and other raw materials in July, 1945; that was up to 6,750,000 barrels a day in July, 1950. Petroleum Administration for Defense says that unless about 700,000 barrels a day of new capacity are added to our refining potential by the end of 1952, the public may be plagued with product shortages.

All that adds up to the need for more carrying capacity. Already almost 60 million tons of steel are buried in the U. S. serving gas and oil industries. Sales of pipe lines averaged only 350,000 tons per year from 1936 through 1945, but during 1949 1.6 million tons of transmission lines were shipped; 2,425,000 tons in 1950. Mr. Goble says that 1951 pipe production will exceed the 1950 record, although he admits that even that "will not be sufficient to satisfy all demands."

Growing: Air Freight

A small but growing unit of the transportation industry is air cargo. Although the airlines have been handling air mail and air express for a number of years, scheduled commercial air freight has been a reality only since October 1944, when American Airlines Inc. started the first scheduled run.

Now some 40 airlines offer air freight service. The average shipment is 170 pounds, to go an average of 750 to 800 miles. Rates are competitive with Railway Express. The airlines specialize in packaged freight and offer three services: Under 2 pounds, the best service is air parcel post; 2 to 20 or 25-pound shipments go most cheaply by Air Express, run by Railway Express; if the shipment is over 20 or 25 pounds, the airlines offer their own air freight.

THE TRUCKS ARE READY, BUT NOT THE ROADS
. . . 7000 miles of major highways dangerous

Big Business—Air Cargo Inc. says that apparel, machinery and machine parts, automotive parts are the major items in that order. Airlines can't begin to handle all the business now available. Much of it has been spurred by rearmament and the need to speed deliveries. Light metalworking items, such as screw machine products and fasteners, often get shipped regularly by air.

The airlines are severely handicapped now because most of the owners belonging to the trade association, Air Cargo, lent half their fleets to the Pacific air lift. Depleted as they are, the airlines did 16 per cent more business in the first quarter of 1951 than in the same 1950 period. If Pacific aircraft are returned between now and July, air freight for 1951 will be 25 per cent greater than for 1950. Another problem in air freight are inadequate ground facilities. An ambitious program to remedy that was planned, but the Korean War shelved the idea.

Not Desperate—Yet

The Nation's transportation is not quite adequate for the expanding production, but the situation is by no means desperate. Except for aircraft, we are getting the moving facilities to do the job. Transport men are gradually beginning to realize that new measures must be developed to cope with the present situation that may bear little resemblance to World War II emergency techniques. We have good fixed facilities for rail and waterways, but more pipe is needed for pipelines, better port facilities for airlines, and, above all, better roads. We need a more comprehensive government policy that will treat transportation comprehensively, not piecemeal.

But in that last reform, a danger must also be avoided. Some 45 per cent of the total $100 billion already invested in transportation facilities is government owned. No transportation man wants that to go any higher. One benefit of a comprehensive government transport policy may be to lessen the bickering among the various forms of transportation. Actually, all forms of transportation have broader areas where they are complementary than where they are competitive. Shippers, particularly, want more transport flexibility so they can use two or three means of transportation on one shipment with less red tape than that means now. On less-than-carload or truckload lots, shippers can get multiple transport service through the 100 freight forwarders in the nation who offer through service via truck and rail, and sometimes air, on one bill-of-lading. But such shipment is far more complicated in full load lots.

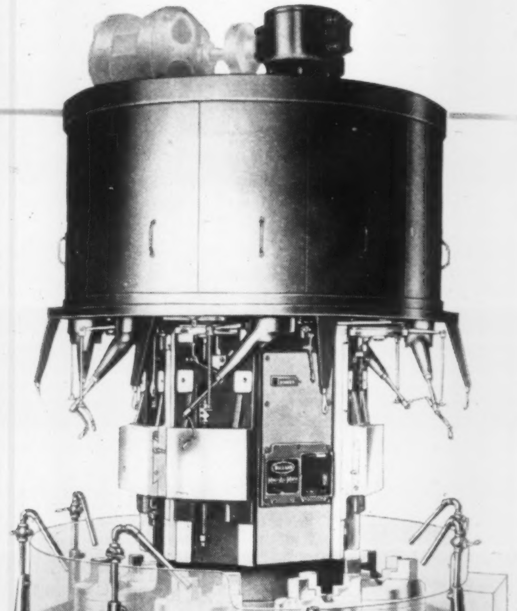
It may be that more multiple media shipping will be the big development in transportation—one short-cut through which the transport industry can haul more freight faster.

Facing the FACTS

WITH

BULLARD

MULT-AU-MATICS



The Rearmament Program is not a pleasant thought BUT today it is a well advanced FACT in many manufacturing plants throughout the world.

Once again Bullard Mult-Au-Matics are Key manufacturing units for defense efforts. Past experience in "tooling up" for such work provides a reliable and practical source of information for any plant already engaged or anticipating contracts on this program.

Mult-Au-Matics are today effectively handling many rearmament projects.

Let us analyze and assist in your manufacturing problems.

Type "D" Mult-Au-Matic 8 Spindle. Hub, Road Wheel for General Patton Tank
Face, Turn, Bore, Chamfer — Drill 6 holes in Hub and 10 holes in Flange

Mult-Au-Matics
Type "D" 8" - 12" and 16" capacities
with 6 or 8 spindles.
Type "K"— a faster machine having 8" capacity
with 6 - 8 - 12 or 16 spindles.
Inquire about twin spindle Type "K"

THE
BULLARD
COMPANY
BRIDGEPORT 2,
CONNECTICUT

Mirrors of Motordom

By H. C. TUTTLE *Detroit Editor*

Although other critical metals and materials will be available in reduced amounts from now on, it will be steel that will control the production of cars and appliances

DETROIT

ALMOST ELEVEN months have passed since the Korean Reds crossed the 38th parallel. In that time a hazy conception of what the term "garrison state economy" means has been developed. A great many defense contracts have been awarded, and a greater than expected amount of industrial expansion has been started. But only a relatively small amount of war materiel has been produced.

That's not surprising nor is it grounds for condemning industry or government. The plain facts are little thought had previously been given to mobilizing for an emergency. When the emergency came, much of the planning had to begin from scratch.

Only Days' Worth—The automotive industry's deliveries of military goods to date are hardly worth mentioning. Compared to total sales their worth represents but a few days' production. General Motors Corp. offers an example, which, because of the company's diversity of products, cannot be regarded as typical. Nevertheless it is revealing.

In the first quarter its sales to the government amounted to only $100 million—including work performed under research and development contracts. The corporation's total net sales were 19.6 times that figure.

Still Make-Ready—The $100-million worth of defense materiel is not lightly brushed aside by corporation officials. Chairman Alfred P. Sloan Jr. and President C. E. Wilson term the progress that has been made "excellent." In their report of first quarter's operations in which they stressed that "output of civilian products . . . in no way interfered with the defense effort," they pointed out that "jet engines, trucks, aircraft propellers, aircraft instruments, bombsights and other defense items either under way prior to the outbreak of hostilities in Korea or similar to the corporation's peacetime products were being produced in increasing quantities." The biggest part of GM's defense work is still in the make-ready stage.

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,878
February	658,918	505,593
March	802,737	610,680
April	684,144	585,705
May		732,161
June		897,853
July		746,801
August		842,335
September		760,847
October		796,010
November		633,874
December		671,622

Weekly Estimates

Week Ended	1951	1950
Apr. 21	166,502	151,613
Apr. 28	162,740	148,274
May 5	154,523	146,337
May 12	158,411	174,480
May 19	156,000	178,314

Estimates by Ward's Automotive Reports

*Preliminary estimate by STEEL.

Amplification — Remarking about noninterference of civilian production with defense work, they made clear that although an adequate supply of passenger cars is essential to give the nation's working force flexibility, limitations on use of materials had pulled the production rate down slightly below that prevailing during most of last year. They said restrictions would be felt more importantly in the current quarter.

Citing imposition of the 80 per cent steel consumption limit on cars, appliances and other civilian products on Apr. 1 to be followed by an additional 5 per cent cut in June, Messrs. Sloan and Wilson said that while other metals and critical materials will be available in reduced amounts, it will be steel that will control production of cars, appliances.

Trends—Their comparison of first quarter 1951 sales of cars, trucks and busses (including those sold to the military services) with the first quarter of 1950 reveals some interesting trends: Passenger car sales from GM plants in the U. S. were 15,984 units lower. Truck sales were 10,567 units greater, a net loss of 5417 units. Completely offsetting this was a substantial increase in sales of GM foreign-made cars and trucks. They rose from 77,569 to 97,654 units.

As a result GM's sales from all vehicle plants totaled 922,264 units—14,668 more than were sold in first quarter 1950.

Half a Margin—Although net sales of $1960 million for first quarter of this year compare favorably with the $1643 million total for the like period of 1950, net income was reduced to $141 million from $212 million last year. Higher taxes, materials and labor costs were chiefly responsible for the drop. Also having a bearing on profits as the defense load grows is the lower profit margin on this class of work. GM's policy is to limit profit margin on defense business to half its peacetime margin.

NSIA Reviews Military Output

GM, quite obviously, is not the only automotive company worth studying to find out how the requirements of a strong civilian economy and an adequate armament program can be meshed without too much gear-grinding.

To learn how motordom's big three are taking on their dual responsibilities more than 300 manufacturers and 50 top military people came to Detroit last Thursday and Friday under the auspices of the National Security Industrial Association, a non-profit organization which served efficiently during World War II to keep the makers and the users of military goods in close touch with each other. Besides GM, Chrysler and Ford, as contributors to the program, was the Jam Handy Organization of Detroit whose training devices are well known to industry and to the military.

Migration Day—The program began with a welcome address by H. F. Vickers, president of Vickers Inc. and Detroit regional vice president of NSIA. James R. MacDonald, NSIA president and president, General Cable Corp., New York, told of the opportunities open to manufacturers for learning of the military establishments' problems. Then the conference migrated from the Book-Cadillac to Chrysler's engineering laboratory. There J. C. Zeder, vice president and director of engineering and research, told the group how his company is engineering for its defense role.

At Ford, where they were met by

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Henry Ford II and Earnest R. Breech, executive vice president, the group heard R. E. Krafve, director of its defense products office, describe conversion by his company to mass production of many kinds of war materiel in World War II and how its experience relates to the present emergency.

Training Techniques — Jamison Handy, president of Jam Handy Organization, reviewed training methods used in both world wars and outlined the latest developments in training techniques. Lt. Gen. Robert W. Harper, chief of the Air Training Command, explained what industry can do to improve the training program.

As the wind-up feature of the program, Harlow H. Curtice, executive vice president of GM and national vice president of NSIA, and Charles Chayne, GM vice president—engineering, conducted a tour of the corporation's military proving ground which adjoins GM's vehicle testing facilities near Milford.

CMP and Automobiles

The NSIA affair (above), following on the heels of the day-long session in which the workings of the controlled materials plan were described to Detroit area manufacturers by NPA officials, brought to a close a week in which the problems and duties of the manufacturer-patriot were brought into sharp focus.

Heading the NPA team to explain CMP in this region was Courtney Johnson, director, Motor Vehicle Division. He is a man well known to the automotive industry (at one time he had been connected with Hudson Motor Car Co.; he is now on leave from his post as assistant to the president and to the chairman of Studebaker Corp.).

The Turning Wheels — Before the program got under way Mr. Johnson told a press conference NPA now has no way of knowing what percentage of the controlling materials—steel, copper, and aluminum—will be taken by CMP-authorized programs. Applications for the materials will have to be processed and the number of manufactured products determined. Not all the companies required to file will have authorized programs, said Mr. Johnson, and it is conceivable that some which do not file will later be covered. That, he intimated, may be necessary for the passenger car industry. "The government," he stated, "will examine with great care the effects on unemployment in the automotive industry." If necessary "to keep the wheels turning" this industry may be covered.

The Hardship Cases—Until CMP gets into full operation—and Mr. Johnson predicts that it will be fourth quarter before it is applied to all covered industries—some assistance may be given by NPA directive for hardship cases. His division has applied for spot assistance to heavy truck manufacturers who are in danger of being forced to close before CMP can take effect. An answer to the request was expected before the week was out.

Another question facing NPA is whether unit or materials limitation orders will be used to control the output of the passenger car industry in the future. Mr. Johnson feels reasonably sure that trucks of all descriptions and automotive replacement parts will be programmed under CMP. He expects that the method of controlling the passenger car end of the industry will be decided in the next month. Some of the factors which are influencing NPA in favor of unit limitation are that use limitations as now in force are difficult to operate under and hard to check on compliance, particularly so since each automotive company follows a different modus operandi in the kind of components it makes.

Helping Hand from GM?

General Motors, which late last year was revealed as having loaned Jones & Laughlin $28 million to help finance its steel expansion program, offered its helping hand to Republic. While GM officials neither deny nor confirm that $40 million has been placed at Republic's disposal, Tom Girdler, Republic's chairman, told stockholders that such was the case. Whether more steel companies will be able to avail themselves of this private source of capital, is, of course, unknown.

Autoworkers' Pay Hikes in June

Pay increases totaling 6-7 cents an hour may be paid to autoworkers come the first of next month. A hike of 2-3 cents is indicated to compensate for the increase in the cost of living in the three months ended Apr. 15. The BLS official figure is expected this week—confirming the estimate by labor and management people in Detroit. The additional 4 cents an hour, which would result from contract provision for the "annual improvement factor," has not yet received WSB approval and would in most cases result in a breakthrough of the 10 per cent wage increase formula. Union leaders though are adamant. They think the feature of the contract should be allowed to function if the whole contract is to be respected.

Changes in Aircraft Orders

Chevrolet's Allison J-35-R23 jet engine contract has been replaced by one for Wright R-3350 reciprocating engines. Best reason for the switch appears to be less make-ready time needed to get the Tonawanda, N. Y. plant into production of the piston type.

MARCONI
WRIGHT
BURBANK
EDISON
BURROUGHS

FORD'S CONSUL: Ready for introduction in the United States is the five-passenger four-door Consul, built in Britain by Ford Motor Co. The sedan has a four-cylinder 92-horsepower engine and wheelbase of 100 inches. It will cost $1700 to $1800 at port of entry

The Business Trend

Blazing 1951 production pace continues unabated. First half output totals will be staggering. Arms, plants, equipment lead the buying parade

REALIGNMENT of industry to the demands of rearmament is proceeding smoothly, despite scattered dislocations and uncertainties as to the future. The new backbone of industrial activity will be by necessity, the defense program. Lending support now is private business, putting tremendous amounts of money into new plants and equipment. As military spending gains momentum in the months ahead, facilities for production of cilivian goods, particularly durables, will be turned to the weapons-making task. Current problems with slackened consumer demand and high inventories should resolve themselves.

Looking forward to the completion of six months of production, industry will find it has set a blazing pace in 1951's first half. The time remaining before more stringent controls and limitations become effective is being used to break production records of all kinds. Pointing up this sustained output drive, STEEL's industrial production index for the week ended May 12 is set at 218 per cent of the 1936-1939 average, lingering at the high marks of the last three months. The previous week's final mark was 217, while a year ago the index stood at 204, the first time the index ever crossed the stratospheric 200 mark.

Autos Pushing Hard . . .

Determination to build as many automobiles as possible before the additional cutback June 1, is evident in the auto industry's production schedules and output figures. In the week ended May 12, the industry was scheduled to turn out 158,411 passenger cars and trucks from U. S. and Canadian assembly lines, says *Ward's Automotive Reports*. This figure would better by nearly 4000 units the prior week's final count of 154,523. Despite mild labor troubles and sometimes acute supply difficulties, U. S. manufacturers are expected to pass the 3-million unit mark this week. A prime reason: Truck production continues at near-record levels.

Production comparisons from now on will have new meaning: One year ago last week the 100-day Chrysler strike came to an end. That corporation's activity boosted the output in 1950's comparative week to 174,480 units and marked the beginning of a breakneck production pace that continued through December. Odds are against weekly output exceeding comparative 1950 figures again this year.

Labor Market Tightens . . .

As industrial mobilization gains momentum, labor supply problems will multiply. Already at high levels, new hirings in defense-busy industries will more than make up for layoffs in slumping or limited civilian lines. Defense production in hard goods industries absorbed labor released during winter slowdowns in seasonal industries, and was a prime factor in preventing a normal unemployment rise in the first months of this year. New entrants from schools and colleges during the next two months should bolster the labor force somewhat.

Metalworking employment in 1951 continues upward at the same steady pace that prevailed through 1950;

BAROMETERS of BUSINESS

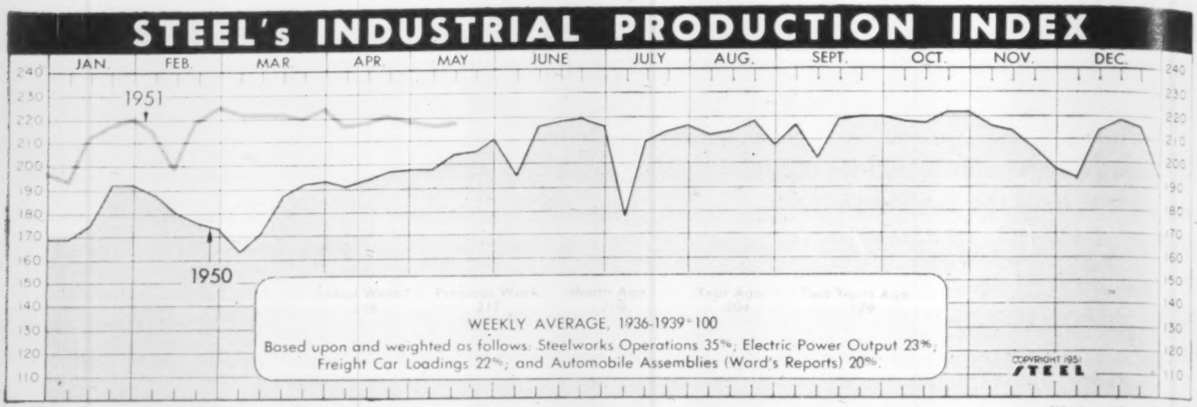
		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	104.0	104.0	102.5	100.5
	Electric Power Distributed (million kilowatt hours)	6,567	6,560	6,747	5,864
	Bituminous Coal Production (daily av.—1000 tons)	1,613	1,737	1,518	1,831
	Petroleum Production (daily av.—1000 bbl)	6,162	6,174	6,120	5,118
	Construction Volume (ENR—Unit $1,000,000)	$294.8	$270.6	$311.2	$183.3
	Automobile and Truck Output (Ward's—number units)	158,411	154,523	162,839	174,480
TRADE	Freight Car Loadings (unit—1000 cars)	805†	803	778	717
	Business Failures (Dun & Bradstreet, number)	181	163	172	217
	Currency in Circulation (in millions of dollars)‡	$27,315	$27,225	$27,166	$27,041
	Department Store Sales (changes from like wk. a yr. ago)‡	+8%	+3%	−9%	−10%
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$14,717	$17,076	$15,593	$13,107
	Federal Gross Debt (billions)	$254.5	$254.7	$254.8	$255.8
	Bond Volume, NYSE (millions)	$14.9	$16.7	$23.6	$17.5
	Stocks Sales, NYSE (thousands of shares)	9,090	10,147	8,420	9,396
	Loans and Investments (billions)†	$70.1	$69.9	$70.1	$66.5
	United States Gov't. Obligations Held (millions)†	$30,836	$30,805	$30,674	$35,916
PRICES	STEEL's Weighted Finished Steel Price Index††	171.92	171.92	171.92	156.13
	STEEL's Nonferrous Metal Price Index‡	242.3	243.0	246.2	169.5
	All Commodities†	182.9	183.4	183.0	155.4
	Metals and Metal Products†	189.6	189.6	189.9	169.3

Industry: *Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.

Trade: †Preliminary. ‡Federal Reserve Board.

Finance: †Member banks, Federal Reserve System.

Prices: †Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.



*Week ended May 12

U. S. Bureau of Labor Statistics preliminary figures reveal that 5,220,000 production workers were employed in March in five major metalworking groups (see chart, below).

No Letup in Steel . . .

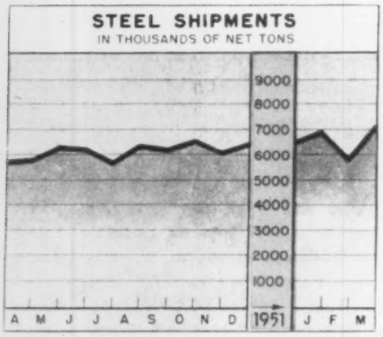
Limited only by actual capacity, the steel industry continues to spew forth near-record quantities of ingots and steel for castings. With shutdowns of furnaces for repairs below normal, mills were expected to continue riding the crest of the record output wave of the past several weeks. Production during the week ended May 19 was calculated to turn out 2,077,000 net tons. Last week's activity accounted for 2,073,000 tons, while a year ago 1,931,000 tons were produced. Early start of the lake shipping season was fortunate, in view of the vast quantities of ore being gobbled by mills.

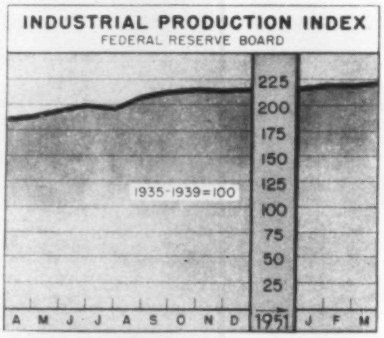
Coal Rate Lags . . .

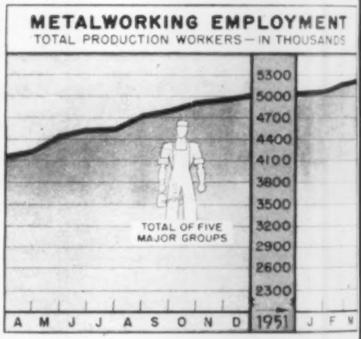
Though continuing to lag on a current-week basis, bituminous coal output is running 20 per cent ahead of last year's production to date. This is due to the near-cessation of mining in February, 1950. Cumulative output in the first 18 weeks of the current year approximates 186,310,000 tons, in comparison to 154,488,000 in the same period of 1950. Production during the week ended May 5 was estimated by the National Coal Association at 9,675,000 net tons, down 655,000 tons from the previous week and well below the 10,983,000 tons turned out in the corresponding week of 1950. Coal sales are good, as many industries are putting in orders for fall and winter needs.

Prices on Skids . . .

A backslide in wholesale prices for the second straight week—this time a sizable one—is the word from the Bureau of Labor Statistics. For the







Steel Shipments

Net Tons

	1951	1950	1949
Jan.	6,904,688	5,482,691	5,788,632
Feb.	5,776,229	5,134,780	5,519,938
Mar.	7,105,078	5,723,340	6,305,681
Apr.	....	5,780,453	5,596,786
May	....	6,252,672	5,234,862
June	....	6,192,438	5,177,259
July	....	5,668,898	4,534,855
Aug.	....	6,326,464	4,918,314
Sept.	....	6,145,354	5,236,196
Oct.	....	6,503,531	935,037
Nov.	....	6,051,145	3,296,809
Dec.	....	6,432,776	5,410,902

American Iron & Steel Institute

Industrial Production Index

	Total Production		Iron, Steel		Non-ferrous	
	1951	1950	1951	1950	1951	1950
Jan.	221	183	254	203	234	180
Feb.	221	180	252	201	218	190
Mar.	222	187	262	205	216	200
Apr.	...	190	...	222	...	198
May	...	195	...	226	...	197
June	...	199	...	231	...	207
July	...	196	...	228	...	202
Aug.	...	209	...	236	...	212
Sept.	...	211	...	245	...	216
Oct.	...	216	...	253	...	223
Nov.	...	214	...	247	...	227
Dec.	...	217	...	253	...	227
Avg.	...	200	...	229	...	207

Federal Reserve Board

Metalworking Employment

Production Workers—Five Major Groups

1950	Prim. Mtls.	Fab. Prod.	Machinery	Elec. Mch.	Trans Equip.
Mar.	982	709	981	580	879
Apr.	1,007	722	1,003	595	899
May	1,026	742	1,022	606	1,045
June	1,050	769	1,033	615	1,078
July	1,054	773	1,032	620	1,070
Aug.	1,086	814	1,060	655	1,118
Sept.	1,105	837	1,050	673	1,134
Oct.	1,117	850	1,104	710	1,157
Nov.	1,125	849	1,133	720	1,128
Dec.	1,142	852	*.163	724	1,160
1951					
Jan.	1,149	846	1,191	710	1,188
Feb.	1,152	852	1,217	715	1,245
Mar.	1,156	856	1,230	719	1,259

U. S. Bureau of Labor Statistics

Charts—Copyright 1951. STEEL

week ended May 8, the all-commodity index was 182.9 per cent of the 1926 average, a healthy drop from the prior week's mark of 183.4. The post-Korean peak of 183.9 per cent was reached in the last two weeks of March.

Building Continues to Boom . . .

Private mass housing contracts outstripped industrial building to take first place in classes of construction awarded in week ended May 10, says *Engineering News-Record*. New contracts totaled $295 million, 61 per cent higher than the figure for the same week a year ago and 7 per cent above the average week to date this year. Industrial building made up $67.2 million of the weekly total. Awards for 19 weeks of 1951, totaling about $5.6 billion, are led by private construction which accounts for $3.4 billion. Public awards account for $2.2 billion.

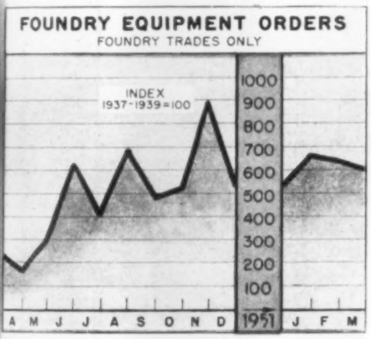
Total contracts awarded in 37 eastern states in April amounted to $1,374,991,000, reports F. W. Dodge Corp. Of this amount $518,021,000 was for non-residential building. The month's construction awards were 8 per cent higher than those of March and 30 per cent ahead of April, 1950.

Trends Fore and Aft . . .

Total employment in April was 61,789,000. . . . A total of 23.4 million homes were owner-occupied in 1950, representing 55 per cent of the 42.5 million homes and farms in the country last year . . . Federal Reserve Board's industrial production index in April remained at 222 per cent of the 1935-1939 average, the same level as in March, and the first interruption in advance since March, 1950 . . . Personal income in March was at an annual rate of $242.5 billion, compared to February's total of $241.3 billion . . . Baldwin-Lima-Hamilton Corp. has taken orders during the past six weeks for 101 diesel-electric locomotives having total value of about $15 million . . . Philco Corp.'s first quarter sales totaled $113,524,000, a new record . . . Despite the war world population jumped 200 million between 1939 and the end of 1950.

Issue Dates of Other FACTS and FIGURES Published by STEEL:

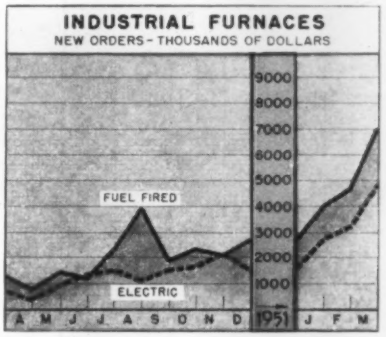
Construction	Apr.30	Ironers	May14	Ranges, Gas	Apr.30
Durable Goods	May7	Machine Tools	May7	Refrigerators	May14
Employ., Steel	Apr.9	Malleable Cast.	Mar.12	Steel Castings	Feb.26
Fab. Struc. Steel	May7	Prices	May14	Steel Forgings	Apr.30
Freight Cars	Apr.23	Pumps, New Orders	May14	Vacuum Cleaners	Apr.30
Furnaces, W. Air	Apr.9	Purchasing Power	Apr.23	Wages, Metalwkg.	Apr.16
Gear Sales	May7	Radio, TV	Apr.23	Washers	May14
Gray Iron Castings	Mar.5	Ranges, Elec.	May7	Water Heaters	Apr.30



Foundry Equipment Orders

	Index		Value in Thousands	
	1951	1950	1951	1950
Jan. . . .	668.0	159.3	$3,075	$731
Feb. . . .	638.6	113.1	2,940	519
Mar. . . .	599.0	225.2	2,758	1,034
Apr. . . .	. . . .	160.6	. . . .	737
May . . .	. . . .	294.9	. . . .	1,353
June . . .	. . . .	622.7	. . . .	2,858
July . . .	. . . .	401.8	. . . .	1,844
Aug. . . .	. . . .	693.6	. . . .	3,183
Sept. . . .	. . . .	483.8	. . . .	2,220
Oct. . . .	. . . .	526.8	. . . .	2,417
Nov. . . .	. . . .	885.5	. . . .	4,077
Dec. . . .	. . . .	526.2	. . . .	2,423

Foundry Equipment Mfrs. Assoc.



Industrial Furnaces

New Orders—Thousands of Dollars

	Fuel Fired*		Electric	
	1951	1950	1951	1950
Jan. . . .	4,033	1,914	2,764	473
Feb.	4,670	616	3,212	697
Mar.	7,019	1,300	4,846	753
Apr.	. . . .	837	. . . .	415
May	. . . .	1,392	. . . .	982
June	. . . .	1,166	. . . .	1,328
July	. . . .	2,247	. . . .	1,445
Aug.	. . . .	3,927	. . . .	1,039
Sept.	. . . .	1,817	. . . .	1,485
Oct.	. . . .	2,306	. . . .	1,603
Nov.	. . . .	2,068	. . . .	2,157
Dec.	. . . .	2,749	. . . .	1,505

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* Except for hot rolling steel.
Industrial Furnace Mfrs. Assn.

specialists in
CMP THINSTEEL

These three steel warehouses normally carry in stock the complete range of cold rolled strip steel specialties made by The Cold Metal Products Company, including low carbon and high carbon analyses, tempered spring steel and stainless grades in the 300 and 400 series. Supply problems are now very difficult. Currently, shortages exist in some grades and sizes, but within the limits of inventory possibilities strip steel fabricators continue to find justification for the descriptive phrase long identifying all Precision produced CMP products—"More feet per pound—more finished parts per ton."

IN THE EAST IT'S THE KENILWORTH STEEL CO.
Located in the metropolitan New York area for quick service throughout the east. 750 Boulevard, Kenilworth, N. J. Phones: New York—COurtlandt 7-2427; New Jersey—UNionville 2-6900.

IN THE MIDWEST IT'S PRECISION STEEL WAREHOUSE, INC.
Well known in the Chicago district for good service and careful attention to customers' requirements. 4409-4425 West Kinzie Street, Chicago 24, Illinois. Phone: COlumbus 1-2700.

IN THE FAR WEST AND PACIFIC COAST IT'S THE COLD METAL PRODUCTS CO. OF CALIFORNIA
On the west coast the only specialists in light gauge precision cold rolled strip. 6600 McKinley Avenue, Los Angeles, California. Phone: PLeasant 3-1291.

PRECISION COLD ROLLED CMP STRIP STEEL

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TINNERMAN
Speed Nut
SAVINGS STORIES

"Putting the Pressure" on SPEED NUTS

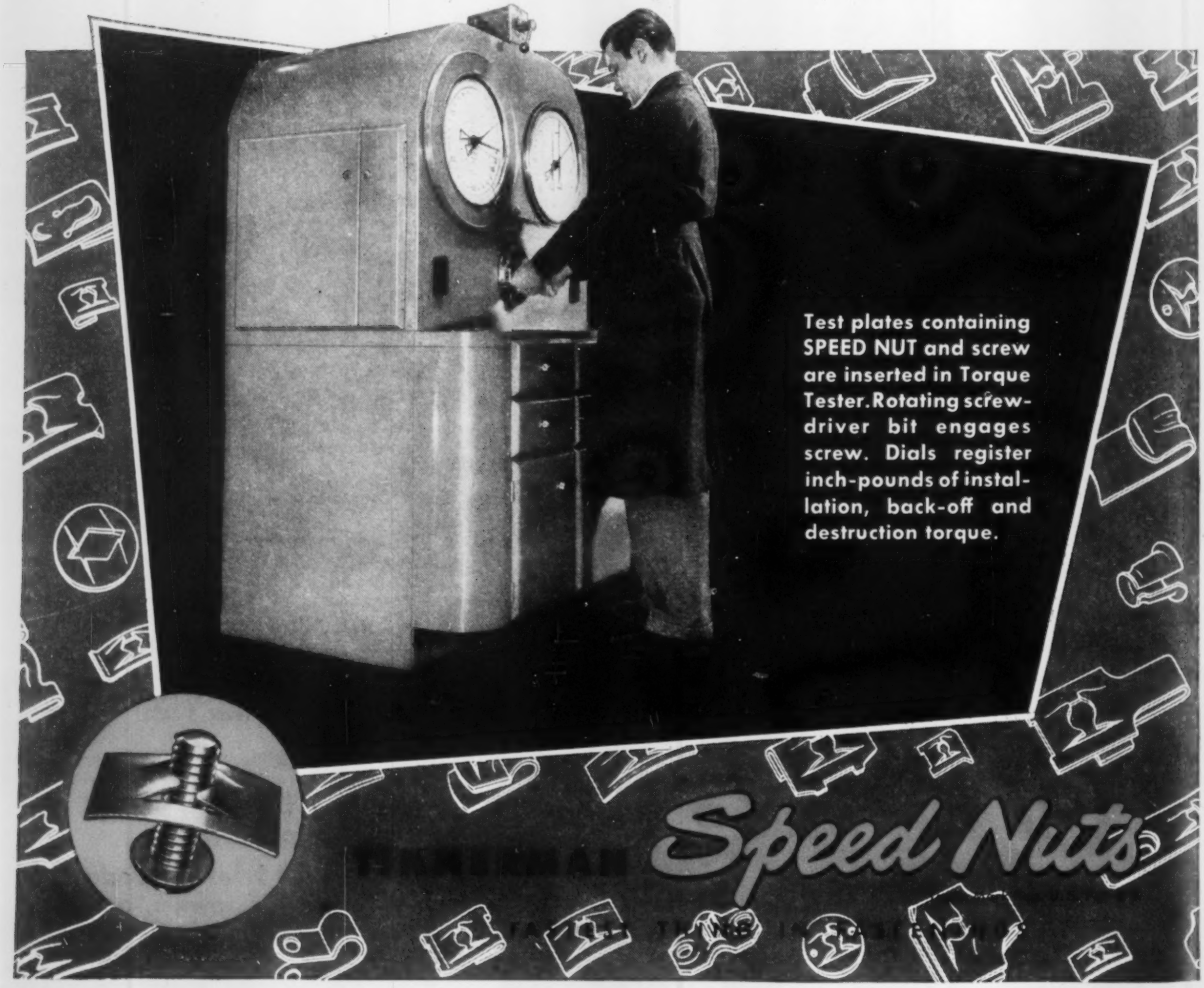
. . . to assure highest quality fasteners for your products

Fasteners must not fail. They are assigned important functions in the assembly of all types of products. And it is up to the fasteners to meet this responsibility.

By way of assuring the successful performance of SPEED NUTS, Tinnerman Products has perfected a system of vigilant quality control.

A key step in these control procedures is determining the average installation torque for each SPEED NUT. This is established by the Mechanized Torque Tester, a special "torture rack" designed by Tinnerman engineers. The torque values set up by this tester assure the extreme holding power and great vibration resistance of SPEED NUTS.

This is only part of the Tinnerman quality control program. The entire procedure has been described in a new illustrated booklet, "The Story of Quality"—write for your copy. TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio. In Canada: Dominion Fasteners Ltd., Hamilton. In Great Britain: Simmonds Aerocessories, Ltd., Treforest, Wales.



Test plates containing SPEED NUT and screw are inserted in Torque Tester. Rotating screwdriver bit engages screw. Dials register inch-pounds of installation, back-off and destruction torque.

Men of Industry

JAMES J. RYAN
. . . heads Superior Metal Fabricating

James J. Ryan was named president of **Superior Metal Fabricating Co.,** Niles, O. He has been associated with the building materials industry for a quarter of a century, and with National Gypsum Co. for the last 17 years.

Kearney & Trecker Corp., Milwaukee, appointed **R. W. Burk** vice president for sales and manufacturing, and **Andrew K. Wilson,** director of industrial relations. Mr. Burk previously was vice president for sales, a post to which he was named in 1943. Mr. Wilson has been manager of process engineering. He became personnel manager in 1947.

Karl W. Osterstrom, specialist in design and development of air-operated hydraulic pumps, was appointed manager of the new pump division of **Binks Mfg. Co.,** Chicago. He is in charge of sales, engineering and development.

Link-Belt Co. appointed **Robert W. Suman** chief engineer of its Philadelphia plant. He was chief engineer for power transmission products since 1946 and now assumes additional responsibility of materials handling equipment engineering. **W. S. Campbell,** chief engineer at Philadelphia for materials handling and applied engineering products, has retired.

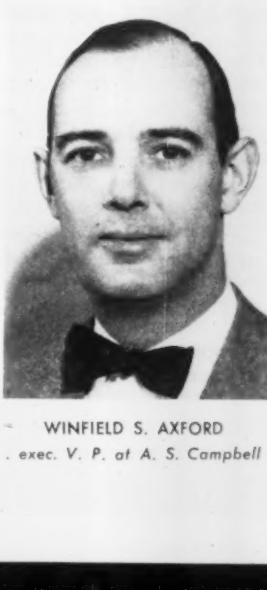
Four appointments at the newly created industrial division of **Spring Packing Corp.,** Chicago, include: **John B. Welch,** assistant vice president; **W. Huntley McPhee,** assistant vice president; **Carl A. Schroeder,** regional manager, New York; and **Lee C. Van Hooser,** regional manager, Los Angeles.

ALBERT B. DISS
. . . Watson-Stillman mgr. of manufacturing

Albert B. Diss was appointed manager of manufacturing operations, **Watson-Stillman Co.,** Roselle, N. J. He joined the company in 1950 as assistant to the executive vice president. He now heads manufacturing, production, purchasing and subcontracting departments.

Kensington Steel Co., affiliate of Poor & Co., Chicago, appointed: **Eugene C. Bauer** chairman; **Kenneth Jensen,** president; **Eugene C. Bauer Jr.,** first vice president; **E. C. Anderson,** vice president; **Roy W. Sergeant,** treasurer and assistant secretary; and **Anthony J. Frystak,** secretary.

Winfield S. Axford, formerly comptroller and assistant to the president, was elected a director and executive vice president of **A. S. Campbell Co.,** Boston, and its subsidiary, **Hunt-Spiller Mfg. Co.**



WINFIELD S. AXFORD
. . . exec. V. P. at A. S. Campbell Co.

J. M. MOON
. . . V. P. of Signode Steel Strapping

J. M. Moon was elected vice president, **Signode Steel Strapping Co.,** Chicago, and continues in his present capacity as director of sales. **Robert Peterson** was elected assistant treasurer.

H. E. Wagner was appointed chief engineer, **Angelus Engineering Corp.,** Los Angeles. He was formerly vice president and chief engineer, Crane Veyor Corp.

Frank Senzik was named assistant superintendent of construction, Youngstown district, **Youngstown Sheet & Tube Co.**

L. R. Williamson joined **Struthers-Wells Corp.,** Titusville, Pa., as consulting engineer in its machinery division. He previously was with E. W. Bliss Co. and Toledo Machine Tool Co.

Fred H. Haggerson, president, **Union Carbide & Carbon Corp.,** New York, has also been elected chairman of the board of directors.

William M. Day was appointed chief engineer, **Perfection Stove Co.,** Cleveland.

William F. Schafer was appointed sales engineer, **Arthur Colton Co.,** division of Snyder Tool & Engineering Co., Detroit. He will have headquarters in the New York office.

American Can Co., New York, elected **T. E. Alwyn** as vice president in charge of sales, and **R. F. Hepenstal,** vice president in charge of manufacture. **L. W. Graaskamp** and **R. C. Taylor,** vice presidents in charge of sales and manufacture, respectively, are now given broader responsibilities, working with the principal executive officers in overall administration of the company.

Edward R. Taylor, general sales manager, **Hotpoint Inc.,** Chicago, was elected vice president. He joined Hotpoint in 1947 as merchandising manager, and succeeding promotions included manager, market development and sales manager.

EDWARD R. TAYLOR
. . . vice president at Hotpoint

Millard J. Friday Sr. succeeds **Robert L. Kielich** as head of the E. W. Blatchford branch of **National Lead Co.,** New York. **Albert J. Monaco** will assist in managing the branch's sales.

George V. Dupont was appointed to the newly created administrative post of manager, central engineering department, **Diamond Alkali Co.** The department is in Painesville, O.

Douglas Aircraft Co. Inc., Santa Monica, Calif., elected **Leo A. Carter,** general manager, Santa Monica division, and **Eric E. Springer,** general manager, El Segundo division, vice presidents. **M. A. Kavanaugh,** formerly chief accountant, was appointed assistant treasurer succeeding **William E. Douglas,** resigned. **K. G. Farrar** was made plant manager, Long Beach, Calif., division to succeed **Jack Simpson,** appointed division general manager.

Marshall C. Peterson was appointed assistant general sales manager, **Republic Coal & Coke Co.,** Chicago.

Sterling Electric Motors Inc. appointed **John F. Ingle** San Francisco district manager, to serve central and northern California and western Nevada; **Robert P. Killion,** Houston district manager serving southeastern Texas; **H. L. Fritz,** Baltimore, to serve the Maryland territory; **E. W. Hodge Jr.,** Birmingham, to serve the Alabama territory. **Joseph P. Foley, C. E. O'Leary** and **R. S. Portner** were added to the staff, New York district office, and **Melvin Maxham** and **John Malloy** were added to the Los Angeles headquarter's sales staff.

George A. Lewthwaite was appointed general manager, Eclipse-Pioneer central division, **Bendix Aviation Corp.,** Davenport, Iowa. **Charles A. Wolf** succeeds Mr. Lewthwaite as Eclipse-Pioneer sales manager.

Wyckoff Steel Co., Pittsburgh, appointed **J. P. Somers** as assistant vice president, with headquarters in its Philadelphia office.

Charles G. Merritt was appointed chief metallurgist of research and development division, Olin Industries Inc.'s **Winchester Repeating Arms Co.,** New Haven, Conn. He was metallurgical engineer in charge of the central metallurgical office in New York of Crucible Steel Co. of America.

CHARLES G. MERRITT
. . . Winchester Repeating Arms metallurgist

George O. Nations was appointed manager of sales-ordnance, **National Tube Co.,** Pittsburgh, subsidiary, U. S. Steel Corp. He succeeds **G. L. Johnson,** resigned. Appointed assistant manager of sales-ordnance is **D. W. Fletcher.**

J. Michael Curto was appointed assistant manager of sales, Pittsburgh district sales office, **United States Steel Co.**

Hyster Co., Portland, Oreg., appointed **J. W. Morgan** north central district manager, industrial truck sales division, with headquarters in Buffalo. He was assistant sales manager, eastern tractor equipment division, Peoria, Ill. **Donald R. Shaffer,** north centra district manager, succeeds **John E. Mitchell** as northeast district manager. Mr. Mitchell joined Field Machinery Co., Hyster dealer in Boston

Hugh A. Farr was appointed Oklahoma City branch manager, **White Motor Co.,** Cleveland. He succeeds **Earl H. Lewis,** transferred to the Cleveland national sales organization as assistant wholesale manager and assistant to the vice president-sales

Joseph J. Schweinfurt was appointed assistant general superintendent in charge of production of the Wright J-65 Sapphire jet engine, **Buick Motor Division,** Flint, Mich., General Motors Corp. He will assist **Roy I. MacArthur,** general superintendent of Buick's jet engine project.

James M. Knox and **Carl W. Hedberg** were made vice presidents of **Research Corp.,** New York. Mr. Knox financial officer, makes his headquarters at the New York office. Mr. Hedberg continues in charge of operations at the Bound Brook, N. J., plant.

W. Fred Reineking was appointed controller of **Ford Motor Co.'s** assembly plant in Buffalo.

L. R. Glass has joined **Pioneer Engineering & Mfg. Corp.,** Detroit, as personnel director.

J. O. Chesley, manager of **Aluminum Co. of America's** railroad division, Pittsburgh, has retired from active service with the company. After June 1 he plans to concern himself with consulting engineering work in the marine and railway fields.

O. Wendell Macy was appointed sales manager, hydraulic power division, **Hydraulic Press Mfg. Co.,** Mt. Gilead

O. WENDELL MACY
. . . div. sales mgr., Hydraulic Press Mfg.

HECTOR P. BONCHER
. . . a V. P. of Dresser Industries

HOMER C. LACKEY
. . . commercial forgings sales, U. S. Steel

ARTHUR RASKE
. . . manages Nu-Matic Grinders Inc.

O. He was formerly sales manager at Logansport Machine Co. Inc.

Hector P. Boncher, general manager, Dresser Mfg. Division, **Dresser Industries Inc.,** Dallas, was elected a vice president of Dresser Industries.

Following retirement of **R. R. Crouch** as superintendent, **Rock Island Bridge & Iron Works Inc.,** Rock Island, Ill., the following appointments were made: **James Hatch,** formerly of the Kansas City Structural Steel Co., becomes production manager of both Rock Island Bridge & Iron Works and **Davenport Steel Co. Charles Pahl** becomes superintendent of Rock Island Bridge & Iron Works, fabricating division of Rock Island Steel Co. **Carl Rexine** becomes chief engineer of both Rock Island Bridge & Iron Works and Davenport Steel Co. The position of purchasing agent is filled by **William Davis,** formerly with Clinton Bridge Corp.

T. D. Harter was appointed eastern district sales manager, Clamshell Bucket department, Blaw-Knox Division of **Blaw-Knox Co.,** Pittsburgh. He will work out of both the New York and Philadelphia district offices, with headquarters in the latter.

Homer C. Lackey was appointed manager of commercial forgings sales, **United States Steel Co.,** Pittsburgh. Before joining U. S. Steel last year as staff assistant to the general manager of sales, Mr. Lackey was area manager of sales in Chicago for Midvale Co.

Two assistant purchasing agents appointed by **Dow Chemical Co.,** Midland, Mich., are **Howard Raymond,** advanced to assistant purchasing agent in charge of the equipment section where he replaces **A. J. DuBord,** recently resigned; and **John E. Charters,** promoted to be in charge of the raw materials section.

John M. Newton was appointed manager of commercial and industrial sales in the Pittsburgh district sales office of **Trion Inc.,** McKees Rocks, Pa.

James H. Duff was appointed assistant manager of sales, New York district sales office, **United States Steel Co.** He was formerly assistant to manager of sales in that district.

Lloyd G. Depner was appointed manager of sales personnel and organization of **American Steel & Wire Co.,** Cleveland, subsidiary, U. S. Steel Corp.

Nu-Matic Grinders Inc. moved from Detroit to Cleveland. It is under the management of **Arthur Raske,** executive vice president. Newly appointed, Mr. Raske was formerly district sales manager of Brush Development Co., Cleveland.

John R. H. Truelsen, abrasive engineer covering southern Wisconsin for **Norton Co.,** Worcester, Mass., was transferred to the northern Illinois territory. **F. Donald Wing,** field engineer in Chicago, was appointed abrasive engineer in Wisconsin succeeding Mr. Truelsen.

Turco Products Inc., Los Angeles, appointed **Donald A. Keating** railroad division sales manager.

J. C. Goolsby was appointed executive secretary of **Copper & Brass Warehouse Association Inc.** which has a temporary office at Bethesda, Md.

Yoder Co., Cleveland, opened a Pittsburgh sales office and placed **Joseph M. Hill** in charge.

E. Horton & Son Co., Windsor Locks, Conn., appointed **Donald B. Huntting** as sales representative in the Cincinnati area.

OBITUARIES . . .

Albert E. Hansen, 82, founder of **Elkhart Brass Mfg. Co.,** Elkhart, Ind., died May 11. He organized the company, manufacturer of portable fire fighting equipment, in 1902.

Layton R. Harms, 47, manager, building specialties department, **Worden-Allen Co.,** Milwaukee, died May 10.

Charles W. Pendock, 61, chairman of the board and former president, **Le Roi Co.,** Milwaukee, died May 9. He had been president from its organization in 1916 until his retirement in 1947. He continued as chairman.

John M. Olwyler, 57, president, **Zonite Products Corp.,** New York, died May 12.

Whitney S. Hamnett, 62, president, **W. S. Hamnett Co.** and **Aluminum Foils Inc.,** New York, American agent and subsidiary of Swiss Aluminum Co., died recently.

Clarence A. Carrell, 54, Atlanta district sales manager, **Acme Steel Co.,** died May 5.

E. A. Thumlert, vice president, **Fairfield Engineering Co.,** Marion O., died recently.

A. R. Harris, 43, president, **Chase Steel & Supply Co.,** Los Angeles, died May 6.

LUKE THE LUBRICATOR
CONTINENTAL
CONTINENTAL

"Look What The Superintendent of a Leading Steel Company Says! We'll send you his name on request."

"The Trabon System on our old blooming mill gives us 50 more steel tons per week! We credit this increase and savings to the elimination of rejects."

Most of your machinery stoppages—due to bearing failures—could be avoided with Trabon. Shutdowns for lubrication are eliminated... Trabon lubricates as your machines produce!

Let us tell you about the features of Trabon oil and grease systems, and how they can save you thousands of dollars. Call or write today.

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OIL AND GREASE SYSTEMS

TRABON ENGINEERING CORPORATION
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Production AND Engineering
NEWS AT A GLANCE

NITROGEN TAMES BORON—Hardenability of boron-treated medium carbon steels is at a maximum with addition of 0.003 per cent boron, according to two Japanese metallurgists who find that further amounts decrease hardenability to a constant when boron exceeds 0.015. They also conclude free nitrogen in steels fixes boron as a nitride and reduces the effective boron soluble in austenite. Hardenability of the boron-treated steels thus decreases markedly when nitrogen content exceeds 0.008 per cent, and the effect of boron is completely suppressed by 0.02 nitrogen. Additions of 0.1 per cent aluminum or 0.03 titanium prior to boron treatment strongly deoxidize and denitrogenize the steel, thus improving hardenability after boronizing.

ONE FOR THE BOOK— Neat system for storing highly finished sheets between covers of plywood "books" has been worked out by an eastern fabricator. Already in use at one manufacturing plant, the arrangement takes a minimum of floor space, gives easy access to individual sheets in transferring from storage to production and reduces manual handling appreciably, thereby lessening possibility of damage to sheet surfaces. —p. 84

NONFERROUS METALS GAINING—In a quarter-century, from 1925 to 1950, the ratio of world pig iron to nonferrous metals production has dropped from 20:1 to 15:1. Primarily, of course, this is due to the rapid strides made in applications and output of aluminum and magnesium, and this makes the figures all the more striking because of the relatively low specific gravity of these metals. Another 25 years probably will see a similar, perhaps even greater, drop in the ferrous:nonferrous production ratio, with titanium likely to supply the principal push.

CHARTING BETTER CASTINGS—Often the key to successful application of a quality control program, whether in the manufacture of screw machine parts or in a steel foundry (p. 76) is a full-time engineer well-schooled in the technique and given sufficient authority to see that conclusions drawn from statistical control charts are geared to process operations. Also he will find his job easier if he masters the diplomacy of getting his ideas across to both management and workmen without incurring resentment of either.

CHILL WINDS (SYNTHETIC)—Aircraft research experts now talk confidently of jets roaming the stratosphere at 12-15 mile altitudes and at hypersonic speeds of, say, 1000 mph or better. Before they do, however, there is a lot more about performance of metals at both low and high temperatures which these researchers are trying to discover. One of their many tools is nothing more than air—lots of it at controlled conditions of temperature and pressure. Thus, the Lewis flight propulsion laboratory of the National Advisory Committee for Aeronautics sets up a $2 million 21,000-ton refrigeration unit for supplying conditioned air to tunnels and other test facilities. Even so, the supply has to be rationed. —p. 80

ATOM PATENTS IN THE CLOSET—Number of U.S. patent applications in the field of atomic energy now owned by the Atomic Energy Commission totals about 2500, of which roughly 80 per cent are still maintained in a secrecy status. About 300 of the "nonclassified" applications have matured into issued patents, while 258 AEC-held patents and applications have been released for licensing to industry. They relate largely to radiation detection apparatus.

SET LIFE EXPECTANCY— Establishing practical tool life in terms of time or number of workpieces between sharpenings is a sure method for attaining greater accuracy and uniformity in production work. For almost any operation it is possible to determine the average length of time a tool will cut before wear begins to affect work size or finish. Changing tools at this time, or slightly before, means quality control, minimizes rejections, reduces tool sharpening time, lessens the amount of cutting material to be removed in sharpening—especially important with carbide tools—and lengthens total tool life. One good arrangement is to have three sets of tools for each job—one working, a second ready to be installed and a third being sharpened.

"SOFT" BLASTING FOR FINISH— Liquid abrasive blasting of metal parts has eight major applications, covering both toolroom and production line. They are: Removing and blending directional grinding lines; removing hardening oxides and discolorations; improving lubricant retention; preparing surfaces for electroplating; mold and die maintenance; improving cutting tool life and appearance; deburring, and general maintenance cleaning. Prospective users should remember that the finish obtained by liquid blasting is a function of the finish *before* blasting. A rough ground surface cannot be made the equivalent of a finish ground piece; a poorly finished die cannot be corrected by liquid blasting. In other words, the treatment is in no sense a dimensional one.

—*A.H.A.*

SCRAP DOWN, QUALITY UP, THROUGH STATISTICAL

DURING World War II, armor plate sufficient to build several hundred tanks a year was being destroyed in testing its "ballistic limit"—how fast a projectile of a certain weight must travel to penetrate the plate. Installation of a scientific sampling method which specified how many test pieces were to be taken from what production heats and how the resulting data were to be combined and interpreted, reduced the quantity of test destruction by about 80 per cent yet assured Ordnance that the product would be entirely satisfactory. Because much of this armor plate was cast material, the foundrymen who were producing it saw for themselves the savings possible by the use of such statistical control methods.

Following the same principles, Ordnance also set up a plan for reduced testing requirements for other castings with similarly beneficial (and enlightening) results to foundrymen. By the use of this plan, the cost of testing was materially reduced but, more important, the flow of material through the shop was expedited and the quality level of the product was raised notably.

After the war, many industries began to introduce statistical techniques into their operations with such success that the whole field of quality control, based on statistical principles, has skyrocketed during the past five years to become what has been termed "one of the sharpest management tools developed in half a century". The foundry industry has been among those experimenting with this technique to measure and control many operations, as well as to evaluate quality of the product, with increasing success. By measuring the "process-capability" of many of the most important steps and taking appropriate action, scrap losses have been reduced, quality improved and production increased.

Production Rate a Factor—As would be expected, quality control methods find their most profitable application in the high production, mechanized foundries where certain castings are produced over a long continuous run, although the same type of techniques can be applied profitably in many smaller foundries. Because the writer is connected with a mechanized foundry producing steel castings, many of the applications discussed will be those related to this type of production.

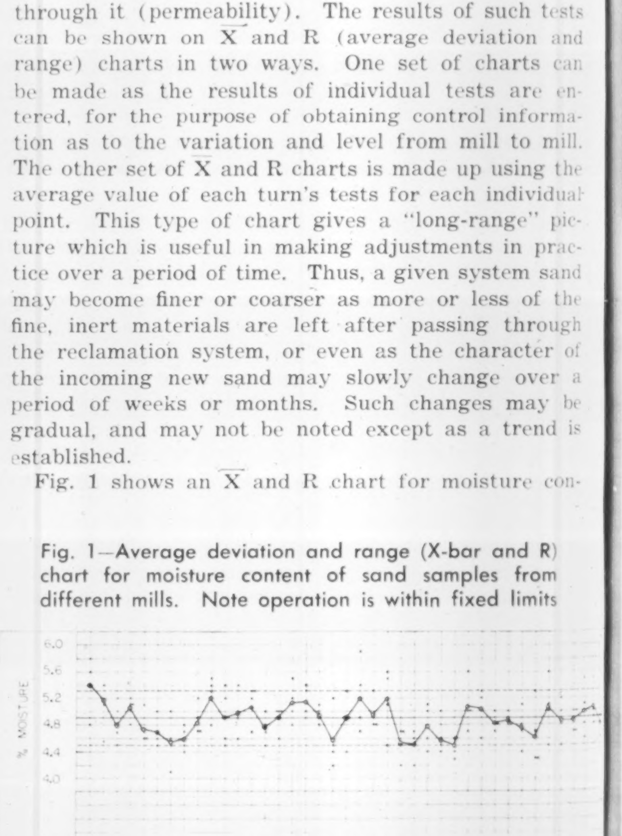
In general, three classes of control charts are used to measure and control foundry operations. One group, known as measurement charts, is made up of measurements taken during the process of such variables as chemical analyses, sand properties, mold hardnesses, core dimensions, amount of welding rod used per casting unit, etc. A second class of measurement charts are those based on variables such as physical properties of the steel produced, casting dimensions, fit of moving parts, and similar aspects of the product itself. A third class of charts gives a picture of the amount and rate of occurrence of defective castings. Such charts are kept on a somewhat different basis than the other two types of charts and are known as "P-charts" or "fraction defective charts".

Consider some examples of these several types of control charts as applied to foundry operation. One of the essential raw materials in the foundry is sand and it must be properly selected and prepared.

As a measure of the physical properties of sand mixes, a sample is taken from almost every mill, which is tested for strength (green bond), for moisture content and for resistance to the flow of gases through it (permeability). The results of such tests can be shown on $\overline{X}$ and R (average deviation and range) charts in two ways. One set of charts can be made as the results of individual tests are entered, for the purpose of obtaining control information as to the variation and level from mill to mill. The other set of $\overline{X}$ and R charts is made up using the average value of each turn's tests for each individual point. This type of chart gives a "long-range" picture which is useful in making adjustments in practice over a period of time. Thus, a given system sand may become finer or coarser as more or less of the fine, inert materials are left after passing through the reclamation system, or even as the character of the incoming new sand may slowly change over a period of weeks or months. Such changes may be gradual, and may not be noted except as a trend is established.

Fig. 1 shows an $\overline{X}$ and R chart for moisture con-

Fig. 1—Average deviation and range (X-bar and R) chart for moisture content of sand samples from different mills. Note operation is within fixed limits



CONTROL SYSTEMS

By HAROLD H. JOHNSON
Metallurgist, Sharon Works
National Malleable & Steel Castings Co.

THIS week the young American Society for Quality Control holds its annual convention in Cleveland, with a lengthy list of papers scheduled to be read on up-to-the-minute developments in the field. The accompanying timely presentation explains how the technique has been applied successfully in a large steel castings plant, the author being credited with pioneer work in the field of quality control engineering. His discussion is the second in a series of quality control case studies in STEEL, the first having appeared in the issue of Jan. 29

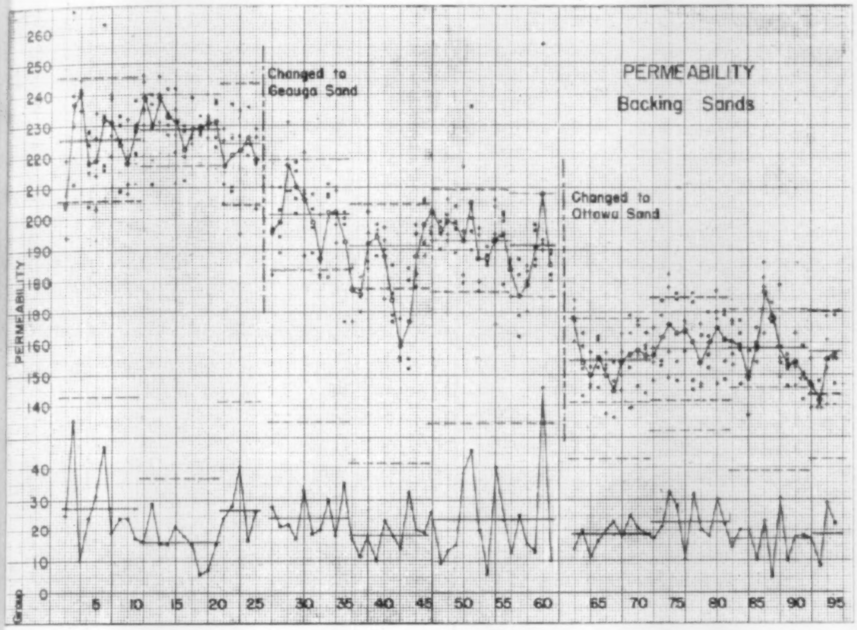


Fig. 2 (left)—Level and spread of permeability values obtained when each of three types of backing sand were in use. A chart of this type aids the study of long-time production trends

Fig. 3—Checking a sand core with a go, no-go gage may be supplemented by measuring a selected few and transferring measurements to X-bar and R charts

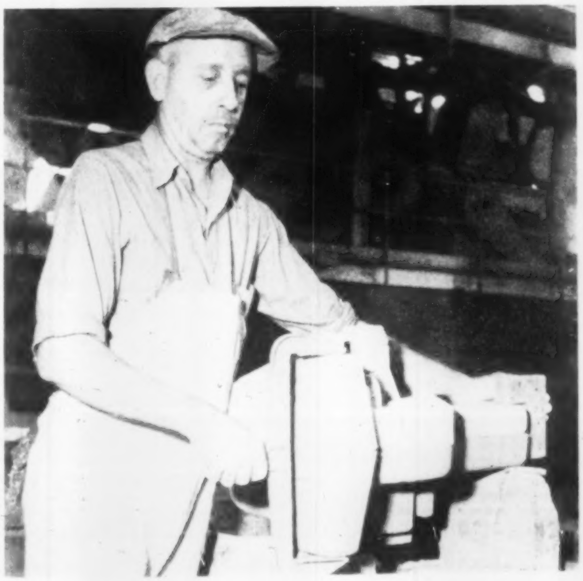
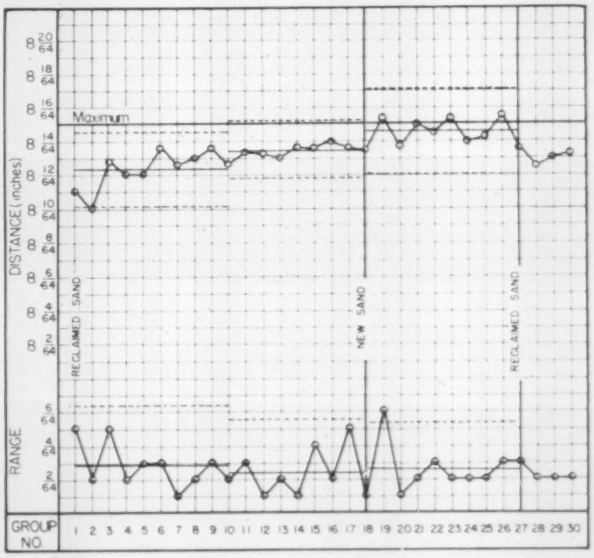


Fig. 4—A change in core sand was immediately reflected in changed castings dimensions, indicating a return to the original sand mix was advisable



trol from mill to mill, while Fig. 2 shows changes in permeability over a period of time. It will be observed from Fig. 1 that we are operating within fixed limits for this property, which limits were based on satisfactory results obtained over a considerable period of operation. This makes for simplicity in charting and at the same time assures a satisfactory moisture control. Groups of four individual determinations are used in all charting. In Fig. 2 are noted the level and spread of permeability values obtained when each of the three types of sand were used. Such a chart is especially valuable for noting trends over a period of operation.

Correcting Core Troubles—Dimensional control of the cores made from these sand mixes and their spacing in the mold is an obvious field for quality control. Many of the cores are inspected only visually, while others are gaged, using a go, no-go gage such as is shown in Fig. 3. Some are set in a jig and passed under a grinding wheel which assures that they will be the right thickness. The setting or spacing in the mold of the cores is another step which requires gaging to assure proper setting.

Most foundries do not measure the absolute dimensions of any of the cores other than by using a gage, but in our practice we have found some core dimensions are of such importance that they are actually measured. The cores to be measured are selected on the basis of an approved sampling plan and thus are representative of the production from which they were selected. In general, $\bar{X}$ and R charts are used to display the measurements and the action to be taken is indicated by such charts.

A further step in this control is measuring critical dimensions on the castings themselves and referring these back to the corresponding core dimensions. Thus, in the production of couplers for railroad freight cars, there is a critical dimension between the lugs. Couplers are selected by a sampling plan and this dimension, which is determined by the core width, is measured and charted as shown in Fig. 4.

For functional purposes, this dimension has a maximum tolerance of 8/64-15/64-inch set on it and the upper control limit for the first 18 groups as tabulated does not exceed this value. At the time of the eighteenth group, a change was made in the core sand mixture in an attempt to minimize some other difficulties and, to our surprise, this change was reflected in the casting dimension determined by this core. In other words, the changed sand mixture did not bond itself together as tightly as the previous mixture had done and we have an increase in core size which is reflected in the casting dimension. The first step taken to correct this condition was the return to the reclaimed sand mix previously used and this change was reflected in the return to the width level of the first eighteen groups. Here is a good example of the use of such charting to serve as a measure of the effects of a process change.

Numerous other examples could be given to show the application of control charts to evaluating measured controls in molding practice. Such measurements might include the uniformity of ramming of the molds, the hardness of cores, the analysis of defective cores and of defective molds (by means of P-charts), even the measurements of core uniformity by charting the density of certain baked cores.

Psychology Is Involved—In some shops, inspectors check each coremaker's work at regular intervals (every half hour or every hour, for example) and the results are posted on a chart at the coremaker's bench. When the quality is poor more frequent checks are made and defect notices are made out and submitted to the foreman on the job. If no improvement is made, notices go to the superintendent and director of inspection, and in some shops the inspector has

Fig. 5—Fixed limits, based on several hundred heats, were set for carbon and manganese as shown by the dotted lines. Heat analyses over a week's time were within the limits here

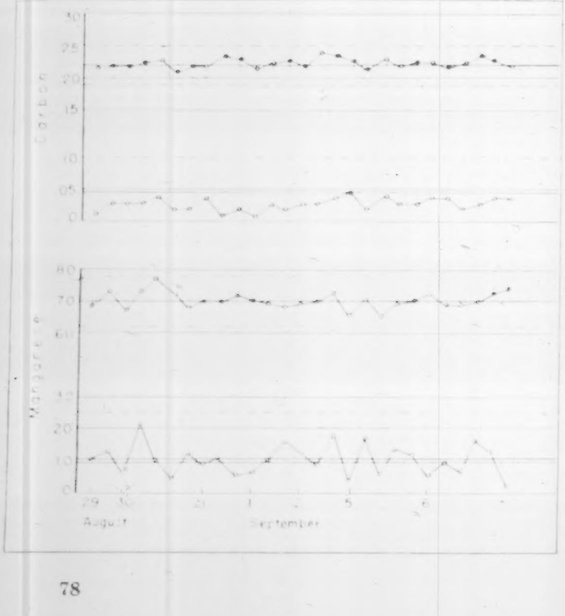


Fig. 6—Three operators working side by side show these differences in elapsed time of making heats. Variations come from factors like ability, industry and ingenuity

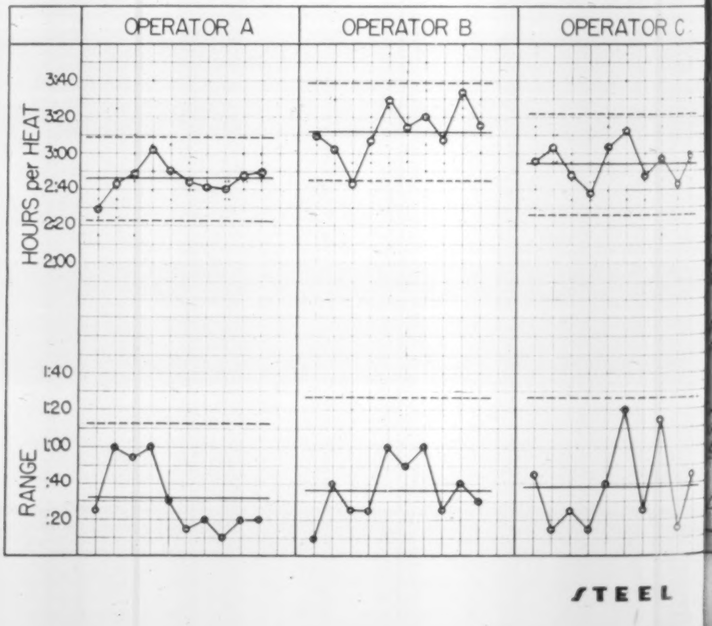


Fig. 7—These freight car coupler castings are gage checked after final grinding, but quality control methods applied to measured samples provided data for process refinement

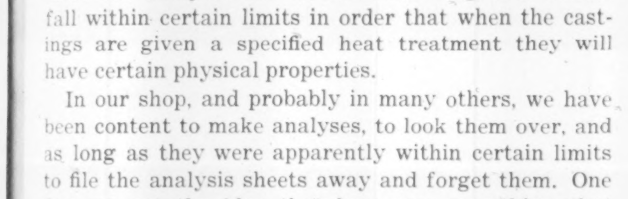
the authority to stop the job until the conditions are corrected. One shop reports the psychological effect of the chart at the coremaker's bench and the action phases of this plan proved to be successful in the reduction of core scrap and the lowering of core cost.

In most shops chemical analyses are made on every heat of iron or steel in order to be sure the material meets certain chemical specification limits. In addition, it is recognized that for each grade of iron or steel the analyses for carbon and manganese should fall within certain limits in order that when the castings are given a specified heat treatment they will have certain physical properties.

In our shop, and probably in many others, we have been content to make analyses, to look them over, and as long as they were apparently within certain limits to file the analysis sheets away and forget them. One day we got the idea that here was something that would be a natural for control study because we have measurements that have been accurately and systematically made and whose control (or lack of it) affected the processing considerably. X and R charts for carbon and manganese were established for each grade of steel and limits recalculated for each group of 40 heats until we had a background of analyses from several hundred heats charted.

Both the average values and the control limits were exhibiting considerable uniformity for each grade of steel and the process was operating at a satisfactory level under these conditions, so we established charts with fixed limits, as shown in Fig. 5. We continue to plot the carbon and manganese values as soon as they become available (silicon values are included for certain grades of steel) and as long as the average and range points stay within the fixed limits, or no more than 1 in 100 falls outside these limits we are satisfied with the process control. However, as soon as we detect a trend in either direction from the average, or the scatter of results becomes great enough to cause points to go out of control limits, action is called for. Whenever any changes are made in the process which will call for a change in the location of these limits, we then resume recalculation of the limits after each 40 determinations until we have a sufficient background to establish new fixed limits.

Fig. 8—Typical report form used in tabulating types of defects in castings and the number rejected for each type of defect


2
7
3
4
Inside Lug 9
Inside Lugs 10
11
1
6
8
2
5
Pedestal Journal Box.

NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY

QUALITY CONTROL - INSPECTION REPORT

PATT. NO ______________ DATE ______________

INSPECTOR ______________ TURN ______________

Inspector will record location number in proper defect column for each casting to be salvaged or rejected. Scrap column to be used only by chief inspector.

IDENT.	CRACK	HOLLOW	POROUS	DIRT	SHRINK	MISRUN	SHIFT	BR. CORE	CORE OFF	DROP	SWELL	BENT		REJECT	SCRAP	REMARKS

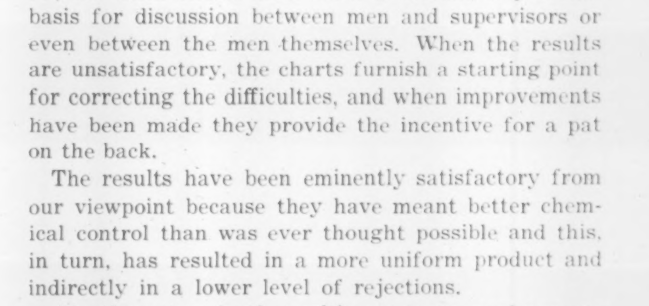
Spurs Competitive Spirit—A second step taken with these chemistry charts is to break down the data so that the plotting is by melters or even by first helpers on the furnaces. The purpose of this step is twofold: To create some competition among the operators to produce the desired results, and to be able to determine better which operators are producing unsatisfactory results so that their technique can be corrected. Such charts then form a factual, impersonal basis for discussion between men and supervisors or even between the men themselves. When the results are unsatisfactory, the charts furnish a starting point for correcting the difficulties, and when improvements have been made they provide the incentive for a pat on the back.

The results have been eminently satisfactory from our viewpoint because they have meant better chemical control than was ever thought possible and this, in turn, has resulted in a more uniform product and indirectly in a lower level of rejections.

At other steps in the melting process, analyses are made of the metal or of the slag and these analyses furnish the material for other charts useful in pointing out both the level and the spread of the readings taken at each step.

Among other variables which have been measured and charted are power (*Please turn to Page 98*)

Fig. 9—This is a histogram showing how changes in procedure affect the percentage of defective castings and the various types of defects

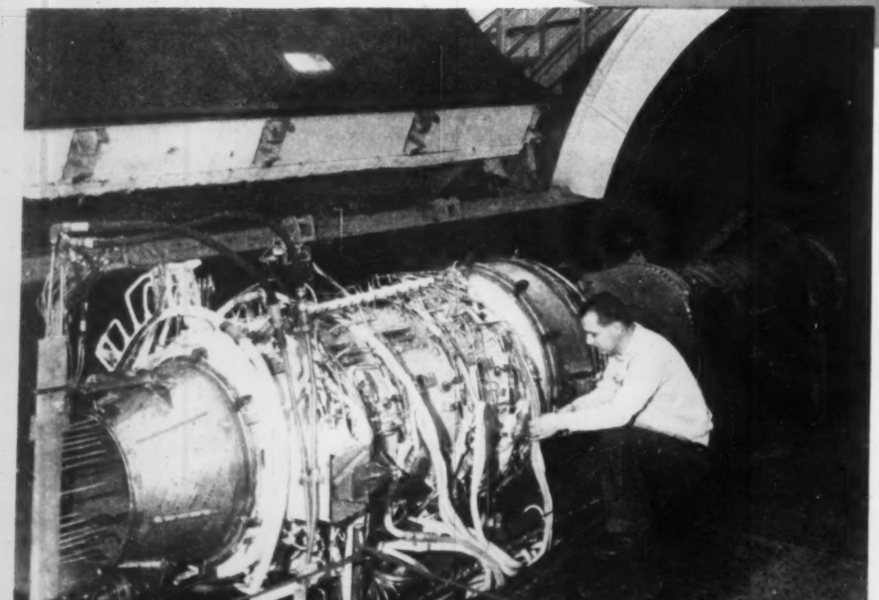


Central air control or dispatching room is the means for feeding air at specified pressure, temperature and humidity to any of the laboratory's 74 test facilities and wind tunnels

TONS OF CONDITIONED AIR

for Jet Engine Research

Refrigeration system with 21,000-ton capacity used to pull down air temperatures for supplying wind tunnels and other test facilities



Left—Full-size turbojet engine here is mounted in the test section of an altitude wind tunnel as a technician checks the hundreds of instrumentation leads. Flight conditions up to 50,000 feet and beyond are simulated

Right—Two types of icing rate meters—a pressure type above and rotating disk type below—are inspected in an icing tunnel where components are subjected to blasts of wet air with velocity up to 400 mph

COLD air manufacturing is big business at the Lewis flight propulsion laboratory of the National Advisory Committee for Aeronautics in Cleveland. The $60 million assortment of 74 separate research buildings and wind tunnels is served by four "cold-making" installations, the largest of which comprises a battery of 14 centrifugal compressors, each rated at 1500 hp and each having its own drive motor, capable of supplying the equivalent of 30 million pounds of ice every 24 hours.

Why synthetic cold air? Well, for one thing, jet engines of today and tomorrow will have to be completely dependable at altitudes of 50,000 feet and higher which means proper functioning at —65° F and in air so "thin" a man would suffocate almost instantly and electrical circuits are apt to act up strangely. Beyond that, a jet engine must handle a terrific volume of air, something like 3000 cu ft per second, against 60 cu ft for the conventional reciprocating aircraft engine. For research purposes, where flight conditions must be simulated, the supply of air in tremendous volume, properly conditioned as to temperature, humidity and velocity, requires enormous equipment installations.

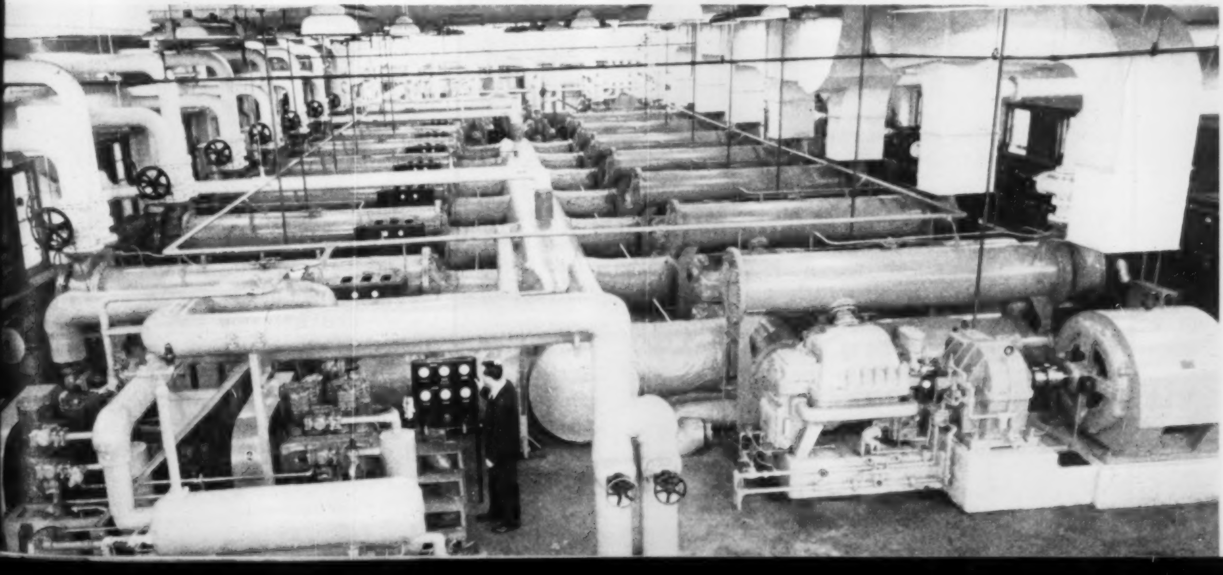
Despite the fact the Lewis laboratory has greatly stepped up its facilities for supplying mechanically cooled air to meet the sharply accelerated research load which world conditions have imposed, it is still necessary to ration the "cold stuff". This is accomplished through a centralized control room, shown in an accompanying illustration, which operates in much the same fashion as a dispatcher's office in a power station or railroad switchyard. This is in reality the nerve center of the laboratory's entire air system. Its master distribution panel includes five sections, each with a network of control buttons, switches and indicator lights tied in with the supply of air at different pressures and temperatures, and feeding air to any selected number of the more than 100 test cells stationed throughout the laboratory. Air temperatures range from 90° F to —108° F. Air supply is measured in pounds per second and to insure that the right amounts get to the test setups which have the highest priorities, the total available supply is budgeted from day to day, around the clock.

As mentioned before, the largest refrigeration installation is a group of 14 Carrier Corp. 1500-hp four-stage compressors which use 30 tons of Freon 12 as a refrigerant in the system. Two 150-hp reciprocating compressors are hooked into the system, to provide for pumping, purging and to insure that a safe level of pressure can be maintained during rare shutdown periods. The entire $2 million system is used principally in servicing the altitude wind tunnel where full-size jet engines can be operated at full power.

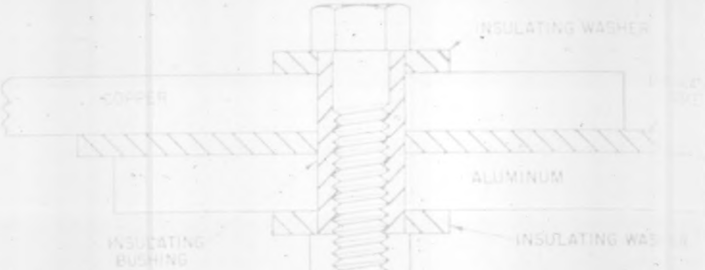
Makeup air for the tunnel is supplied by six pairs of reciprocating compressors. Air velocity is controlled by an 18,000-hp fan which powers the stream through a 20-inch diameter tube as it approaches the test section of the tunnel. Cooling of the air is through a fin-and-tube arrangement in the tunnel. A flash cooler in the refrigeration system is the heart of this equipment, temperature being regulated by manipulation of dampers in a line connecting the cooler to a suction header.

The same refrigeration system is used alternately to condition air for an icing research tunnel, where icing clouds are simulated and the phenomena of icing and de-icing of full-scale aircraft components can be studied. Air speeds up to 400 mph are provided by a 4160-hp fan. Both hot air and electrical de-icing devices are subjected to test. A typical problem might be the analysis of ice formation on turbojet engine inlets, lips, accessory housing, island fairing, compressor guide vane and screens. Ice originates from variable water sprays, introduced into the air stream before it impinges on the test piece. Such studies are vitally important, since in a turbojet engine, power losses up to 50 per cent may originate at the air inlet, and up to 18 per cent at the exit.

Another large user of NACA air is the overhaul and assembly section for compressors and turbines in the engine research wing. Among operations here are tests on various types of compressor wheels. In one case, by providing air at —50° F to an eight-stage compressor assembly, discharge air temperature was held to 250-300° F when running at 5000 rpm, or 30 per cent of design speed. Net result was a $20,000 saving in fabrication cost of the test wheel which had 900 aluminum alloy blades.



Below—Claimed the largest single installation of refrigeration equipment anywhere are these 1500-hp centrifugal compressors with capacity of 21,000 tons



Method of insulating a bolted joint composed of aluminum and a dissimilar metal

How to Avoid....
Galvanic Corrosion

By following some practical rules of metal fabrication you can minimize the hazards of bimetallic corrosion

IN the design and fabrication of metal structures or equipment first consideration is given to fulfilling the mechanical and physical requirements of the job. However, it is also desired that the article remain in serviceable condition for some minimum period of time. Thus, factors which are generally thought of as functions of time must be taken into consideration. One important factor is the use of metals and fabrication practice which avoids the hazards of galvanic corrosion.

What Is Galvanic Corrosion? — Galvanic corrosion or bimetallic corrosion, as it is sometimes called, is accelerated electrochemical corrosion produced when one metal is in direct contact with another more noble metal, both being in the same corroding medium. Corrosion of this type results usually in an accelerated rate of corrosion for one member of the couple and protection for the other. The protected member, the one that does not corrode, is called the nobler metal.

Galvanic corrosion is generally thought of as consisting of total corrosion, which comprises the normal corrosion that would occur on a metal exposed alone plus the additional amount due to contact with the more noble material. During the corrosion process, an electric current is generated by the two metals in contact. Magnitude of this current is equivalent to the acceleration of the corrosion of the more vulnerable material beyond its normal rate.

Most obvious method of eliminating galvanic corrosion hazards is to use one metal or alloy for the entire construction. However, this is not always feasible. In cases where it is impractical to do this, then combination of metals or alloys should be selected which is known to develop little galvanic action under the service conditions. Alternately, the dissimilar metals or alloys can be completely insulated electrically from each other.

With a knowledge of the galvanic behavior of metals and alloys it is possible to set up a series which will indicate the tendencies of metals and alloys to form galvanic cells and to predict the probable direction of the galvanic effects. Such a series is shown in the table.[1]

In the accompanying table, metals grouped together have no strong tendency to produce galvanic corrosion of each other, and from the practical standpoint are relatively safe to use in contact with each other. The coupling of two metals from different groups and distant from each other in the list will result in galvanic, or accelerated corrosion of the one higher in the list. The farther apart the metals stand, the greater will be the galvanic tendency, as may be determined by measurement of the electrical potential difference between them. Relative positions of metals within a group sometimes change with external conditions but it is rarely that changes occur from group to group.

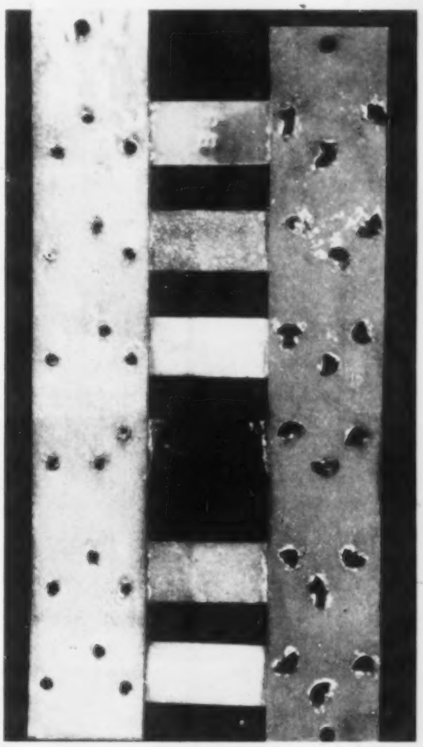
Actual corrosion cannot proceed unless there is a flow of electrical current. Just as in ordinary corrosion the ease with which this current can flow and the magnitude of the current are controlled by a number of basic factors:[2] (1) Conductivity of the circuit, (2) potential between anode and cathode, (3) polarization, (4) relative cathode and anode areas, (5) geometric relationships between dissimilar metal surfaces; and (6) contact between metals.

Influence of relative areas of anodic and cathodic surfaces can be illustrated by the example of a riveted plate in sea water. A steel rivet in a copper plate suffers very rapid attack, whereas a copper rivet does not accelerate the corrosion of a steel plate to any appreciable extent. In this example the initial potential difference is the same in each case, although the extent of galvanic corrosion is greatly different. Current in galvanic corrosion increases with increase in area of the cathodic member of the couple. The maximum rate of increase is set by the constant current density principle which states that the galvanic current is directly proportional to the cathode area.[3]

Sometimes unexpected galvanic corrosion may be caused by a change in structure or surface characteristic of one of the metals in the couple, such as the graphitic corrosion of cast iron in which case the cast iron may be originally anodic, yet with corrosion and formation of an impervious graphite layer,

FLASH BUTT WELD
ALUMINUM TUBING

Above—Method of insulating a joint composed of dissimilar metals (aluminum and copper) under conditions where condensation of moisture may occur. Sketches courtesy Aluminum Co. of America



Right—Effect of Alodine chemical treatment for aluminum in retarding galvanic corrosion. Upright strips: Left, untreated 2S aluminum; right, Alodized 2S aluminum. Cross pieces top to bottom: Stainless steel type 304; 75S-T aluminum; cold rolled SAE 1010 steel; 24S-T aluminum; 61E-T aluminum. Back of assembly shows condition of burred brass rivets used to hold pieces. Treated section (right) shows rivets and treated aluminum intact, while on the left burred sections of rivets have completely corroded and disappeared; surrounding untreated aluminum is pitted. Corrosion test conditions: 21 months exposure in semi-industrial atmosphere plus 150 hours salt spray. Courtesy American Chemical Paint Co.

may become anodic.[4] Metals and alloys within the copper and nickel groups have no great tendency towards mutual galvanic corrosion.

Several of such materials may often be used together, except in cases where the area of a less noble material is considerably smaller than the area of the more noble material in contact with it. This is a generalized statement to which there may be exceptions. Nickel, Monel and Inconel are fairly close to each other in the galvanic series, and usually they can be used together in equipment and structures without danger of significant damage.

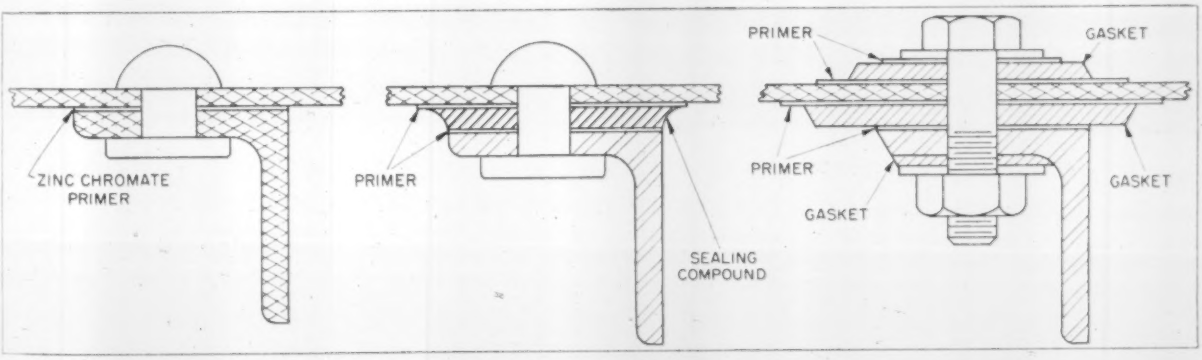
Aluminum and Magnesium—Dissimilar metal contacts are of particular importance with aluminum and magnesium. For instance, copper in contact with aluminum causes a high current to flow from the aluminum through the corrodant to the copper. Thus, the aluminum is rapidly attacked and the copper protected. On the other hand, zinc having a higher solution potential than aluminum under many corrosive conditions, will protect aluminum and will itself be sacrificially corroded.

A special condition is of interest where aluminum and magnesium are in contact while immersed in salt water. The magnesium, because of its higher solution potential, causes a current to flow in a direction which should electrolytically protect the aluminum, that is, the magnesium is the anode and the aluminum is the cathode, but the basic corrosion products caused by the rapidly corroding magnesium will severely attack the aluminum. Thus, both metals suffer rapid corrosion.

Compounds of metals reducible by aluminum or magnesium dissolved in liquids also greatly accelerate the corrosion of aluminum and magnesium. Cathodic metals plate out as the result of chemical interaction and the setup galvanic cells. For example, rainwater splashing through copper screens accelerates the corrosion of aluminum window frames.[5]

Aluminum Joints—Joints may be particularly susceptible to corrosion. (*Please turn to Page* 104)

Left—Recommended assembly of magnesium riveted to magnesium. Center—Assembly of magnesium riveted to dissimilar metal to avoid galvanic corrosion. Right—Assembly practice recommended for magnesium bolted to dissimilar metal or wood. Courtesy Dow Chemical Co.



Sheets Stored in Plywood "Books"

"Library" system provides easy access to racked material, reduces floor space requirements, cuts handling costs

By HERVE A. LESSARD
Supervisor of Intraplant Material Movement
Pratt & Whitney Aircraft Division
East Hartford, Conn.

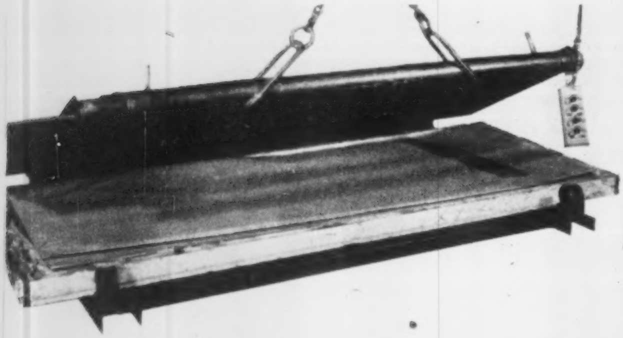
A NEW system for in-plant handling and storage of sheet stock, involving the use of permanent metal-and-plywood "books," appears to offer advantages in terms of reduced floor space requirements, savings in man-hours of handling effort and elimination of damage to highly finished sheets, such as aluminum alloy, stainless steel and the like.

Sheets usually are stored by either of two methods. One is flat storage in stacks of wood crates on the plant floor, a procedure which is inefficient for a number of reasons. Too much floor space is required; improper stacking often leads to bending and warping, possibly resulting in scrapped material; sheets in open crates may be damaged; difficulty is experienced in keeping separate different sizes and types of sheet; and the removal of material from the bottom of a pile of crates results in wasted time in rehandling of the material on top.

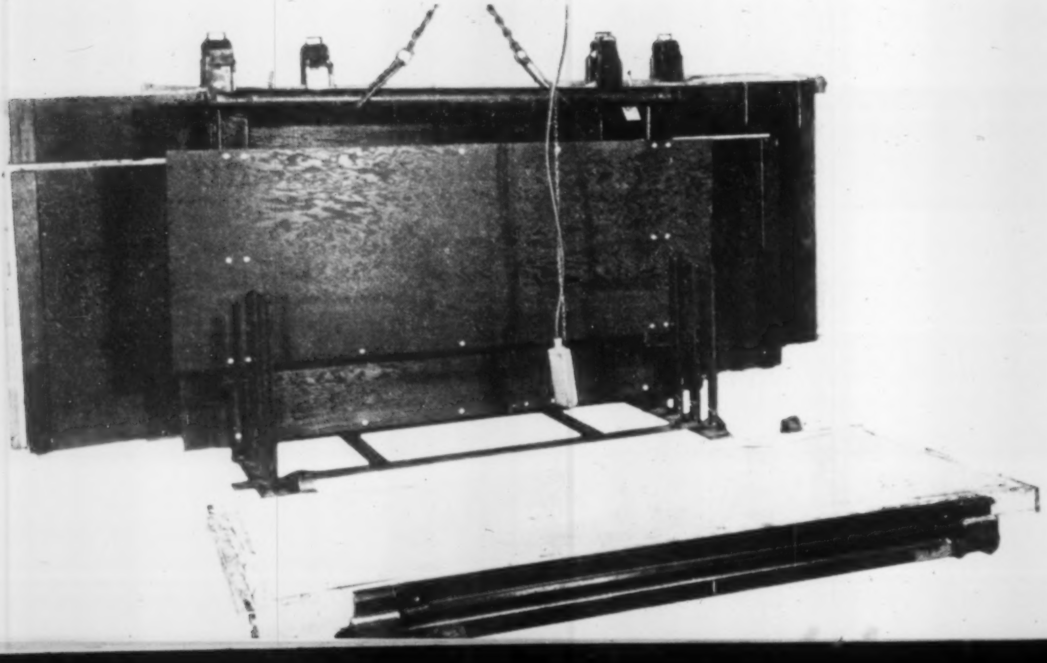
Another arrangement in common use is loose storage of sheets in vertical racks. This requires less floor space and offers protection to the stock, but it may prove objectionable to large users of sheet material, since each piece has to be handled separately to and from storage, resulting in excessive handling charges.

Sheet Steel "Pages"—To overcome some of these problems, a new arrangement has been devised whereby packs of sheets are placed in a "library" of "books," filed in a row of welded steel racks. It consists of four basic elements:

1. Welded steel transfer rack
2. Vertical welded steel storage rack, or "bookcase"
3. A "book," comprising two "covers" of heavy plywood, steel reinforced, and a steel channel "book" hinge
4. Fixed or mobile V-rack, or "book" stand.



Left—Here one steel-reinforced plywood cover is lowered over the opened crate. Note welded eyes on the rack for receiving crane hoist bar



Below—Crate of sheets is placed on transfer rack awaiting positioning of covers. Rack in background has filled "books"

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Mesta-Thomson Flash Welder installed in a Mesta High-Speed Continuous Pickling Line

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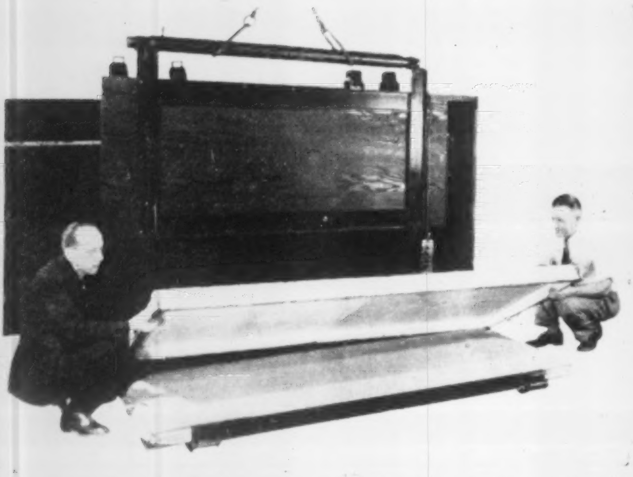
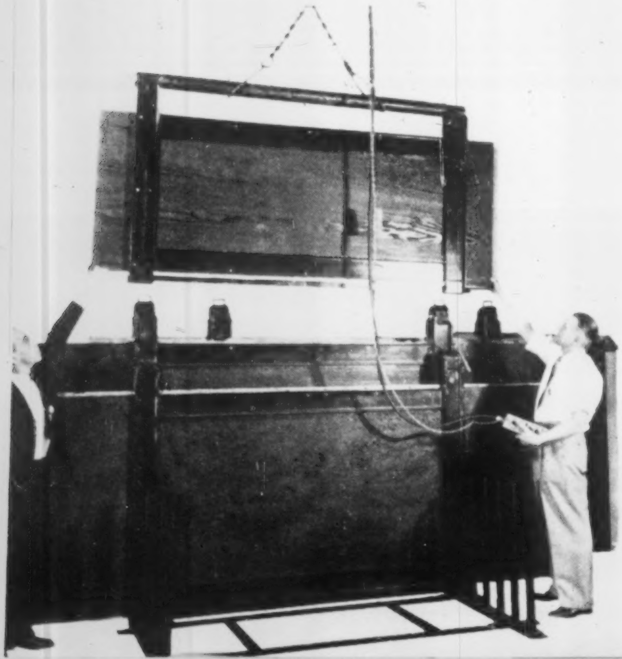


Transfer rack, crate and one cover are turned over and the crate removed so that second cover can be lowered into place and hinged

Here is how the system works: When a crate of sheets is received it is placed on the transfer rack. No work is done by hand; all "muscle" is supplied by the plant's overhead traveling crane. The top of the crate is removed and the steel channel "book" hinge is hooked to the transfer rack. Then one side of the book is connected to the other side of the hinge, so that it lies on top of the opened crate.

Now the crate is turned over by the crane, by means of the specially-designed hoist bar with adjustable ends, like those of a paper towel holder, to fit into the welded eyes, thus locking the book cover and transfer rack together. When the crate has been turned over the transfer rack is removed. Then the other side of the crate is taken off; the second cover of the book is attached in place of the transfer rack, and the crane then swings the book into its proper slot, readily accessible whenever it may be needed.

Finished "book" is lifted by overhead crane into the "library" which will accommodate assorted widths and lengths



Book Opens on Rack—When access to the book is required to obtain sheets for testing, inspection or production, the book containing the needed sheets can be swung into a fixed V-rack, or "bookstand." The sides of the V-rack are at a 70-degree angle since, when the book is open to that angle, the hinge then automatically disengages.

When the book is opened one or more sheets may be removed and transported on a truck to the point of use. Often, however, the shearing operation or other initial stage of production may be located at a considerable distance from the "library." In that case a mobile V-rack can be used to transport the entire "book" to the point of use. Then the book can be used to facilitate the removal of unused stock and its prompt return to the "library."

If on a given job 40 sheets were requested by production, this stock can be handled and delivered far faster from a "library" than from flat storage. But the saving does not end there. If, on the job in question, all 40 sheets were not used, the remainder must be returned to storage. With flat storage the stacking and unstacking begins all over again to store the sheets in their proper crates. With the new system the "book" is always on top.

Suppose, on another job, 10 sheets from ten different lots were required. With flat storage as many as ten piles of crates would have to be unstacked and restacked to uncover the needed sheets . . . . at prohibitive cost in man-hours. With the new system the varied sheets would be on hand as fast as the overhead crane could move.

In-Plant Application—At Pratt & Whitney Aircraft the system is being installed for in-plant use, but it could also realize important savings for manufacturers using warehouses for storage. The system could enable all handling up to actual production to be done in the warehouse because of the saving in warehouse floor space. Then in-plant sheet handling would be eliminated entirely.

While the Pratt & Whitney system has been designed for their specific requirements, the component elements of the system, all uniform in design, can be structurally engineered to meet any user's specific needs as to size and load capacity.

The system now being installed by Pratt & Whitney Aircraft will provide for the "library" storage of sheets between 2 feet and 5 feet in width, and up to 14 feet in length. The "bookcase" will be constructed so that 1500 pounds may be stored every 6 inches of floor space. Pratt & Whitney will store between 750,000 and 1 million pounds with this system in half the floor space now used. Where, in the present system of flat storage, 18 men are required to perform handling in connection with the five functions of receiving, lab testing, inspection, storage and processing for production, only six men will be needed with the new system—a saving in man-hours of 66 2/3 per cent. And the costly alloy sheet used in the manufacturing operations is certain to be well protected from damage in handling and storage.

The book storage system is manufactured by Acme Tank & Welding, division of United Tool & Die Co. Inc., West Hartford, Conn., as sole licensee.

CALENDAR
OF MEETINGS

+ Denotes first listing in this column.

May 23-24, **American Iron & Steel Institute:** General meeting, Waldorf-Astoria, New York. Institute address: 350 Fifth Ave., New York 1.

May 23-24, **American Society for Quality Control:** National convention, Public Auditorium and Hotel Cleveland, Cleveland. Society address: 22 E. 40th St., New York 16.

May 24-25, **Anti-Friction Bearing Manufacturers Association Inc.:** Spring meeting, Edgewater Beach Hotel, Chicago. Association address: 60 E. 42nd St., New York 17.

May 24-25, **Society of the Plastic Industry Inc.:** Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Society address: 67 W. 44th St., New York 18.

May 28-30, **Metal Treating Institute:** Spring meeting, Hotel Colorado, Glenwood Springs, Colo. Institute address: 271 North Ave., New Rochelle, N. Y.

May 28-31, **Grinding Wheel Institute:** Spring meeting, The Homestead, Hot Springs, Va. Institute address: Greendale, Mass.

May 28-June 6, **World Petroleum Congress:** The Hague, Netherlands.

May 28-June 8, **Canadian International Trade Fair:** Exhibition Grounds, Toronto, Ont.

June 4-6, **American Gear Manufacturers Association:** Annual meeting, The Homestead, Hot Springs, Va. Association address: 302 Empire Bldg., Pittsburgh 22.

June 6-8, **The Aluminum Association:** Spring meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Association address: 420 Lexington Ave., New York 17.

+June 6-7, **American Society for Personnel Administration:** Annual convention, Hotel Statler, New York. Society address: 2917 E. 79th St., Cleveland 4.

+June 6-8, **American Leather Belting Association:** Spring meeting, Pocono Manor Inn, Pocono Manor, Pa. Association address: 41 Park Row, New York 28.

+June 10-12, **Liquefied Petroleum Gas Association:** Mountain States Convention & Trade Show, Troutdale-in-the-Pines, Evergreen, Colo. Association address: 11 S. La Salle St., Chicago 3.

June 10-13 & 13-16, **National Metal Trades Association:** Annual western plant management conferences, Dell View Hotel, Lake Delton, Wis. Association address: 122 S. Michigan Ave., Chicago 3.

June 11-13, **American Supply & Machinery Manufacturers Association Inc.:** Industrial Supply convention, San Francisco. Association address: 1346 Connecticut Ave. N. W., Washington 6.

+June 11-13, **Symposium — "Analysis and Metallography of Titanium:"** Illinois Institute of Technology, sponsor, Sheraton Hotel, Chicago. Institute address: Technology Center, Chicago 16.

+June 11-13, **Electric Metal Makers Guild Inc.:** Annual meeting, Seignoiry Club, Montebello, Que. Guild address: Box 6026, Washington Station, Pittsburgh 14.

+June 11-14, **American Society of Mechanical Engineers:** Semi-annual meeting, Royal York Hotel, Windsor, Ont. Society address: 29 W. 39th St., New York 18.

+June 11-14, **American Boiler Manufacturers Association & Affiliated Industries:** Annual meeting, Skytop Lodge, Skytop, Pa. Association address: 613 Perry Payne Bldg., Cleveland 13.

+June 13-15, **Southeastern Conference on Industrial Organic Finishing:** Bristol, Tenn.-Va., Foreman's Club, sponsor, Senior High School, Bristol, Tenn. Conference address: R. K. Cooper, Monroe Calculating Machine Co., Box 191, Bristol, Va.

+June 15-30, **Seattle International Japanese Trade Fair:** Edmundson Pavilion, Seattle. Address: Port of Seattle, Box 1878, Seattle 11.

+June 17-20, **National Metal Trades Association:** Eastern plant management conference, Mayflower Hotel, Plymouth, Mass. Association address: 122 S. Michigan Ave., Chicago 3.

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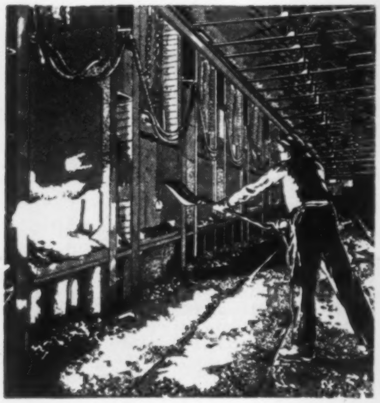
RAMMED HEARTHS

Cut Furnace Downtime



Study of open-hearth furnace bottoms at western steelmaking shop results in constructive recommendations. Use of oxygen in working heats, manganese spread between first and last ingot and experience with basic brick in furnace linings are discussed at annual meeting of Open-Hearth Committee

EFFICIENCY, determined by the time element, has progressively increased for various phases of open-hearth bottom replacements. Contributing factors to these improvements include accumulative experience, close co-operation between masonry and steel construction personnel, and minimize interference by charging cycles on adjacent furnaces.

This was brought out by P. A. Gaebe, masonry department, Kaiser Steel Corp., Fontana, Cal. at the 34th Conference of the National Open-Hearth Steel Committee and Blast Furnace, Coke Oven and Raw Materials Committee of AIME, Hotel Statler, Cleveland, April 2-4. Mr. Gaebe's paper on "Practical Considerations of Open-Hearth Construction" won the 1950 McKune Award.

The speaker pointed out that heat losses from 800 to 1200 Btu per hour per square foot of hearth area have been determined through uninsulated pans. He believes 50 per cent of this reduction in thermo efficiency could be saved theoretically by effective insulation. Insulation of the pan will logically cause a considerable retention of temperature in the higher components of the furnace bottom. This may result in a deeper and more rapid penetration of refractories by bottom boils. The question of economics involved in the issue does not warrant the use of pan insulation in conjunction with the extensive water-cooling facilities used within the furnace.

Temperature gradients recorded through the various refractories indicate that the inclusion of fire brick of high refractoriness in a bottom is unnecessary.

Rammed Hearths—The average chemical analysis of the ramming mix is as follows:

Compound	Per Cent
Fe_2O_3	8.18
MnO	0.04
SiO_2	9.12
Al_2O_3	1.20
CaO	1.34
MgO	79.63

The mix was tempered with water proportioned from 4.4 to 7.1 per cent as determined by the apparent physical pack obtained. It was shoveled in layers of 2 to 3-inch thickness and rammed to about ½-inch in an average of five passes. Six pneumatic rammers with 6-inch flat heads were operated simultaneously. A bottom contour was established at a pitch slightly under ½-inch per foot. Density of the rammed bottom varies between 151 and 159 pounds per cubic foot.

Magnesite Hearths — Magnesite as sintered on hearths of two furnaces was of natural ore source and coarse grained texture with a more than desirable content of lime and alumina fluxing agents.

Addition of 10 to 20 per cent of open-hearth slag to materials such as this will effect a marked reduction of the MgO content, though the resultant fluid formation does develop a dense cohesion of the periclase grains for a well-sintered bottom.

Experience of installation for such hearths should include the knowledge of extended furnace "downtime," nonproductive consumption of furnace refractories and high fuel costs. Increased downtime for sintering amounts to 92 hours. This time on the basis of tons per hour, indicates potential tonnage loss, or an equivalent consumption of furnace refractories between eight and nine nonproductive heats. Total fuel costs for firing a rammed hearth amounts to 32 per cent of the total fuel costs for the magnesite hearth.

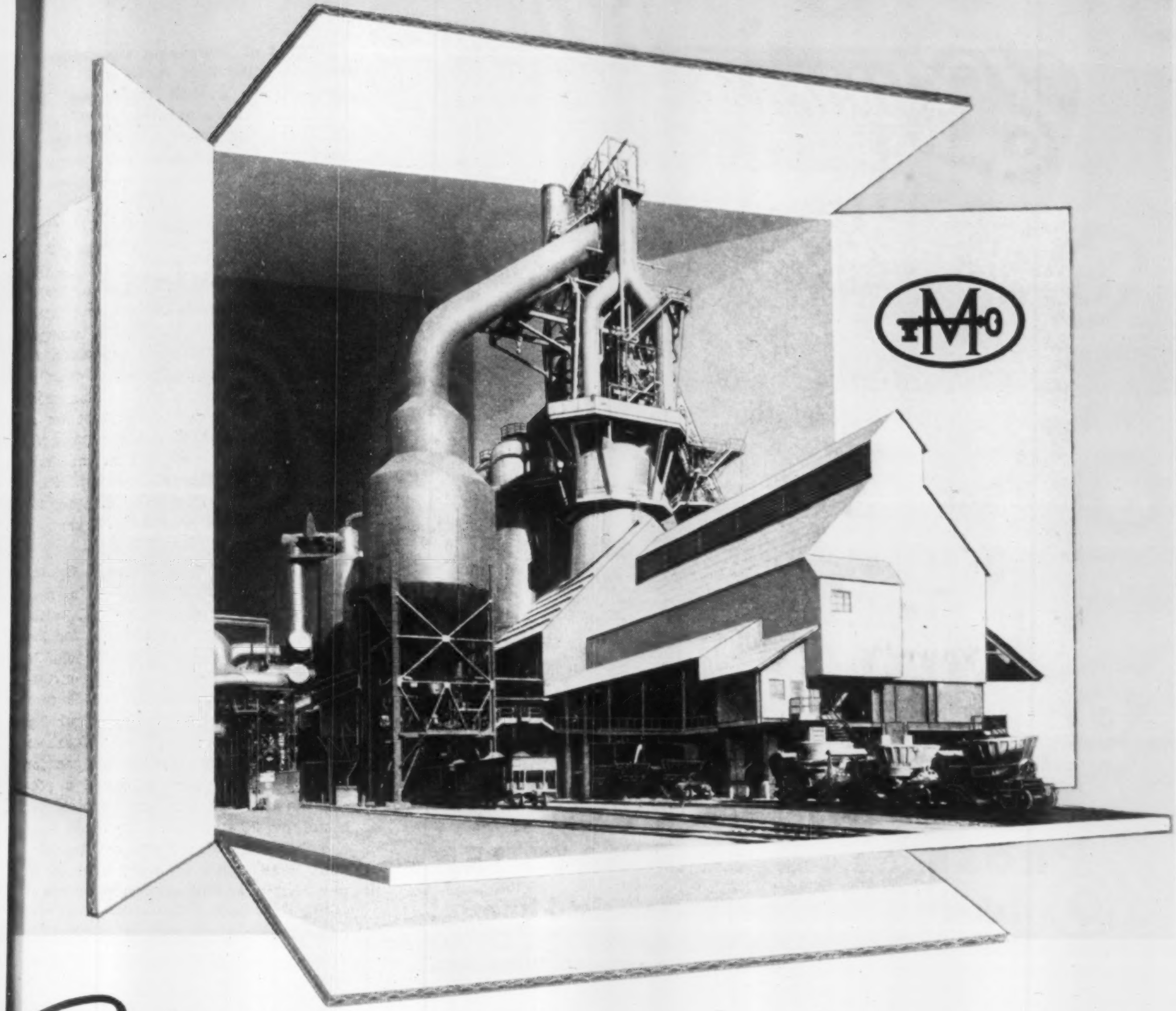
Mr. Gaebe, in conclusion, made the following observations on magnesite vs the fully rammed hearth:

1—A 35 per cent decrease in installation time, with resultant saving from increased production to defray 50 per cent of total bottom costs, may be realized potentially on a rammed hearth vs grain magnesite construction.

2—Fully rammed dimensions resolved initial material cost of 30 per cent over and above comparable costs for semirammed and magnesite hearth construction. Man-hour requirements for installation of the two hearth types approximately are the same.

3—Furnace downtime, as a result of bottom delays on a rammed hearth for first 500 heats indicates advantage of 1½ minutes delay per heat less than delays recorded on magnesite hearths. Conclusive evidence of the superiority of a hydraulic set high-magnesite hearth over the sintered magnesite type has yet to be established from a performance viewpoint. Service experience, plus physical appearance, warrants an opinion that a projection of furnace downtime for bottom delays will continue to show the advantage of a rammed surface.

4—Volume of clay brick in furnace bottoms affords sufficient resistance to thermal conduction, without detrimental heat retention in the upper components of the hearth, to warrant exclusion of pan insulation.



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450 Miller St., Benton Harbor, Michigan, U.S.A.

Method of Increasing Open-Hearth Output—Quality of scrap is a major problem for overall production. In amplifying this statement G. C. Lawton, superintendent, No. 2 Open Hearth, Inland Steel Co., Indiana Harbor, Ind., mentioned that stockers at Inland's plant during 1950 recovered from foreign scrap 225 tons of undesirable elements including 20,155 pounds of aluminum, 14,355 pounds lead, 296,435 pounds brass and 119,609 pounds copper, and more went into heats. Ability to charge scrap is dependent upon pan sizes. A 28 cubic foot pan affords a density of 92 pounds per cubic foot compared with 96 pounds per cubic foot for a 33.8 cubic foot box. Larger pans reduce the number of cars in the drag and make for faster charging. Substituting 33.8 cubic foot pans for 28 cubic foot pans permitted a savings of 17 minutes per heat.

Use of Oxygen in Furnace Operation — Wheeling Steel Corp.'s new oxygen plant at Steubenville, O., stated C. W. Drabers, was built for the purpose of obtaining an increase of 33 per cent in production. The generating plant has a capacity of 132 tons of oxygen per 24 hours, the gas being delivered to the open-hearth furnaces in 8-inch mains. Use of oxygen for combustion purposes afforded a production of 14.63 net tons of steel per hour, or 20 per cent increase over the base figure. Shop average for 1951 is 16.56 net tons per hour, or 36 per cent over the oxygen program as originally built. Benefits thus far derived from the use of combustion oxygen include shorter time of heats, less wear and tear on furnace banks, a reduction of bottom and bank delays averaging 8 minutes per heat and elimination of checker burning. Savings in fuel costs has offset the cost of oxygen consumed. The volume of refractories used per ton of steel was 19½ per cent under the average for the five previous years. Oxygen consumed per ton of steel was 520 cubic feet for combustion and 80 cubic feet for decarburization. The oxygen lance is a ¾-inch bare pipe immersed in the bath and lasts from 8 to 10 minutes.

Manganese Spread—Loss of manganese from the first to the last ingot poured depends upon the type of steel being made, the manganese and silica content, the time in the ladle and the type lining used, according to a Chicago district steelmaker. Practice at a Canadian plant is to add all the manganese to the ladle and thus make the loss more consistent; the recovery is 4 per cent better.

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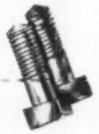

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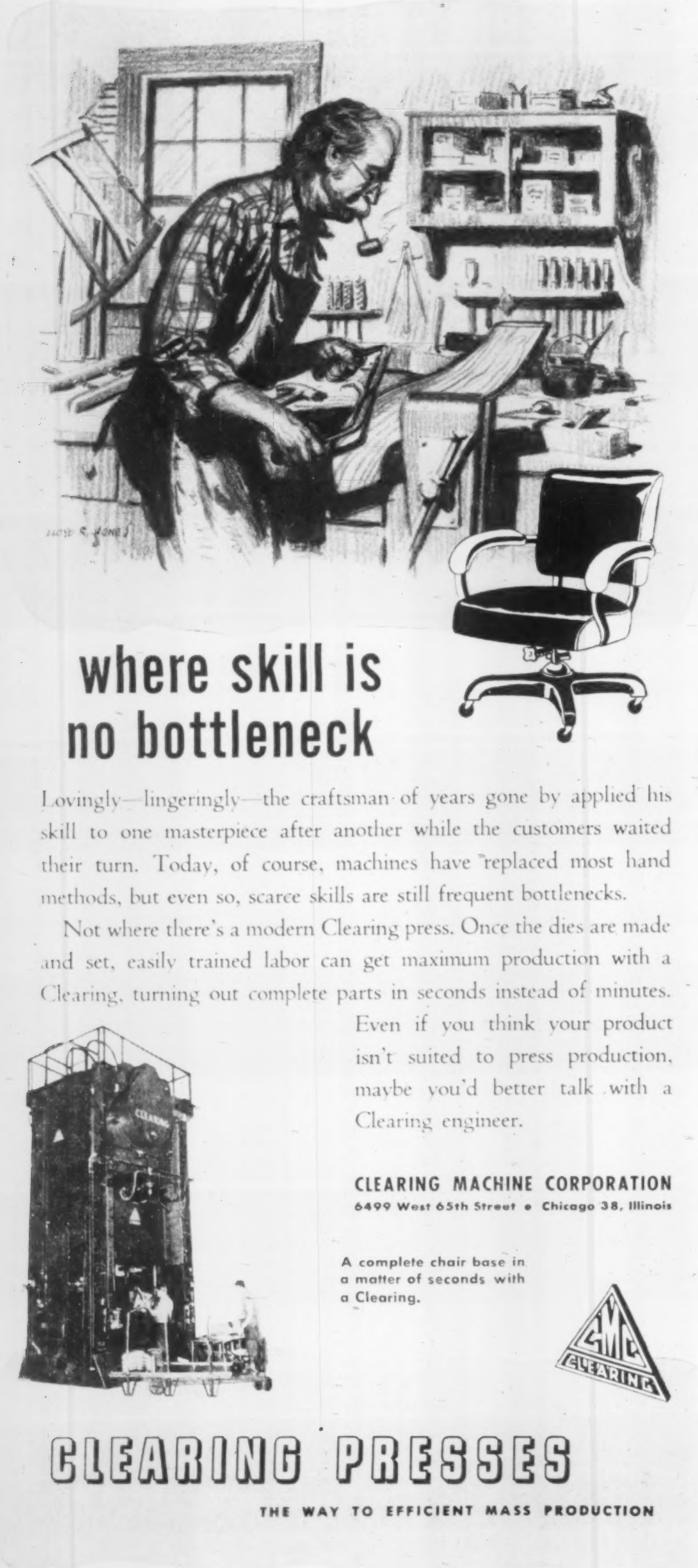

where skill is no bottleneck

Lovingly—lingeringly—the craftsman of years gone by applied his skill to one masterpiece after another while the customers waited their turn. Today, of course, machines have replaced most hand methods, but even so, scarce skills are still frequent bottlenecks.

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CLEARING PRESSES
THE WAY TO EFFICIENT MASS PRODUCTION

Weirton's experience with basic brick to increase the campaign of furnaces was outlined by S. J. Dougherty, metallurgical engineer, Weirton Steel Co., Weirton, W. Va. The company's first suspended basic end installation was on the 550-ton furnace which replaced a 200-ton furnace of conventional silica end construction.

Availability for 1950 was 95.62 per cent with a production of 290,928 tons in 349 operating days, or 34.74 tons per hour tap to tap. Average availability of the shop was 94.94 per cent or 22.7 tons per hour. The charge for this 550-ton furnace is 65 per cent blown metal using 4.0 per cent limestone and is worked in the manner of a conventional scrap-hot metal heat. The principal availability advantages lie in the large tonnage per tap, longer runs on uptakes and bulkheads, little or no repair to chill wall side of uptakes and fan tail nose and rapid removal of slag pocket accumulations.

Success with the first attempt at this type of construction gave impetus to a changeover to suspended basic ends on Nos. 8 and 10 furnaces, each of 400 tons capacity and tapping into two ladles. The charge in these furnaces is of the same type as used in No. 1 furnace.

Availability for six months on No. 8 furnace with silica ends was 92.31 per cent with a production of 103,341 tons. This compares to 109,140 tons at 96.11 per cent on basic ends. Rate of production was 27.57 and 26.28 tons per hour tap to tap respectively.

No. 10 produced 101,350 tons on silica at 91.62 per cent compared to 102,539 tons at 94.8 per cent on basic, at 25.75 and 26.06 tons per hour tap to tap respectively.

Satisfaction with the full basic ends of Nos. 1, 8 and 10 furnaces encouraged further use of basic brick in the construction of No. 13, a completely new 550-ton furnace similar to No. 1 with suspended basic ends. In addition to this, basic end bulkheads were installed on the other four large 400 to 465 ton furnaces. This application resulted in increased availability of 5000 to 9000 tons per year permitting full roof runs without any repair work to the 9-inch basic bulkhead.

Development of the "zebra" roof inaugurated an industry wide trial of basic brick in alternate rows, staggered in 4 and 4½-ft. courses up from the rear skewback. All of the furnaces use this type of construction.

Four out of 12 zebra roofs show an increase of from 10 to 20 per cent in roof life. In two cases where poorer roof life was shown there was an in-

(*Concluded on Page 97*)

crease of approximately 1 ton per hour tap to tap. Approximately 10 to 20 per cent more heats were obtained up to the patch and in some cases no patch was required in the rear skewback area. Three of the 12 furnaces showed less total patching when the alternate rows of basic brick were used.

Truck Industry Must Expand

Truck industry must continue to gear its operations to expansion despite current critical shortages of vehicles and parts says J. N. Bauman, vice president-sales, White Motor Co., Cleveland. Mr. Bauman called on members attending the National Tank Truck Carriers Association's mid-year meeting to keep their trucks in good working condition to keep abreast of this expansion.

"The seriousness of the situation at a time when manufacturers cannot keep up with orders," he said, "can be better realized if we understand that today's truck is, on the average, 7 years old. One million trucks are more than 14 years old. Almost 2½ million are ten years or more older. And trucks are constantly being given more work to do on closer schedules.

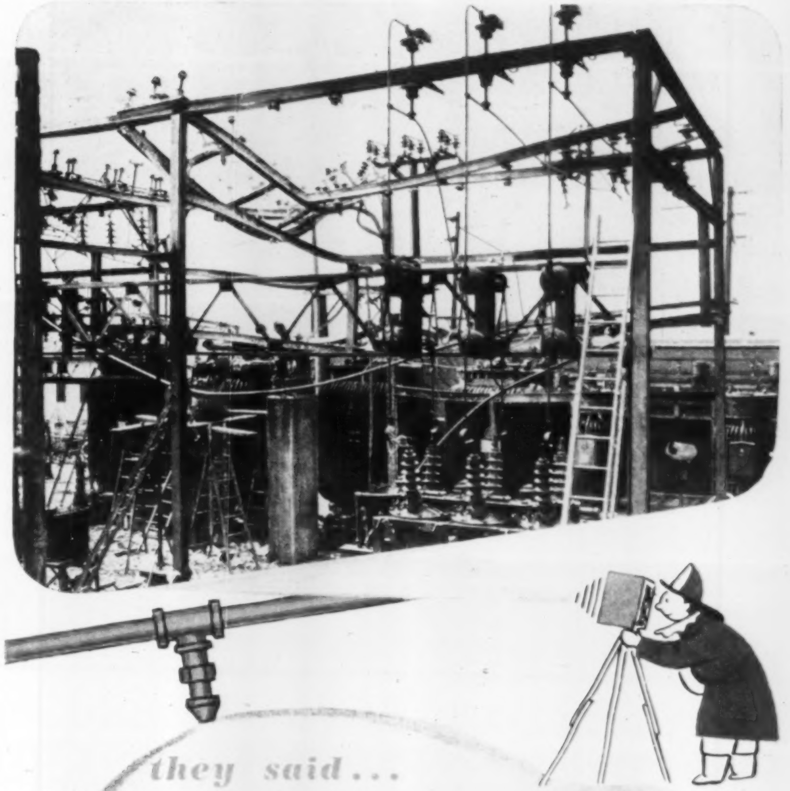
"Under the present accelerated national defense effort, there will be further need for expanding the truck fleet to handle increased defense production of all industries", he said. "It all points to the fact that our present truck fleet must be kept in the best running condition possible to handle the nation's truck transport demands, expected to be about 25 per cent over 1949—125 billion ton-miles of intercity freight. Trucks hauled 8.3 billion tons of freight in 1949—three times the total tonnage carried by all other major forms of transportation combined."

As an example of what his company is doing to lick the problem, Mr. Bauman cited the creation of an Emergency Service Corps program enrolling every White outlet and owner to keep trucks in good working condition.

Salem Builds J & L Furnace

United Engineering & Foundry Co. awarded a contract to the Salem Engineering Division of Salem-Brosius Inc., Salem, O., for a pusher type billet reheating furnace for the rod mill Jones & Laughlin Steel Corp. is building at its Aliquippa Works.

The two-zone furnace will have a capacity of 60 tons per hour when heating 2½-inch square billets 30 feet long. It is designed to burn either natural gas or coke oven gas. Completion is anticipated in the third quarter of this year.



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That's right. Some well-intentioned individuals had it figured out that the hazard of fire at transformer sub-stations or industrial power generating units needed no particular study. So, as evidence, we offer the photograph above—proof of the fact that electrical equipment fires not only can, but do happen, and —with serious consequences.

Although damage to this transformer bank and supporting structural members was severe, the unseen loss of man-hours, out-of-service time and other factors, actually represents the major damage. They're losses, too, that seldom show up in fire reports.

In these days of our nation's need for maximum defense effort, you cannot afford to be without positive fire safety at all times. "Automatic" FIRE-FOG would have extinguished this electrical blaze instantly. Other systems of "Automatic" Sprinkler protection are available for the safeguard of any classification of commercial, industrial, or institutional property.

You can't overextend your practice of fire safety, for to anticipate fire is to avoid its ravages.

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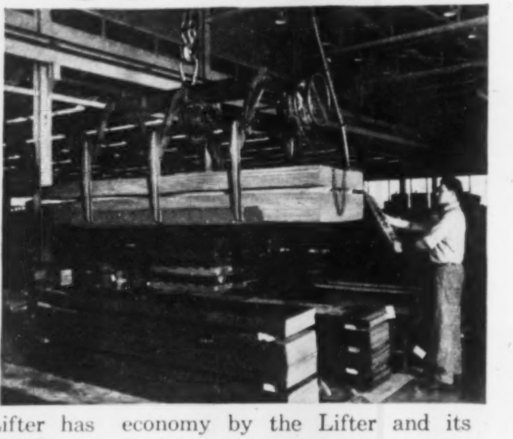

The A. B. Dick Company, Niles, Illinois, found that this C-F Lifter has substantially reduced man hours and crane time required to move stock in and out of storage.

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Scrap Down, Quality Up

(*Continued from Page* 79)

consumption, time from tapping of one heat to tapping of the next one from each furnace, temperature measurements (by operators, by types of steel, etc.) and fluidity measurements.

Fig. 6 shows sections from three charts which indicate differences between three operators as measured by the elapsed time of their heats from tap to tap over the same period of time. The operators are working side by side under similar conditions, but the differences in their ability, industry and their individual methods of making heats is somewhat reflected in these measurements. As the charts of the individual operators are plotted over an extended period of time, changes and trends in their performance may be readily and accurately noted and corrective steps taken.

Following heat treatment, castings are cleaned to remove adhering scale and sand and they are then chipped and ground to condition them both as to the desired appearance and to meet the required gages. Most gages are of the go, no-go type because these are adequate for most tolerance requirements. Fig. 7 shows an inspector applying such gages to freight car coupler castings.

We have found there are certain critical dimensions on each of the principal types of castings which must be held within the prescribed tolerances and we have, therefore, set up a practice of selecting samples from each day's production on which these dimensions are measured. Results are charted using the $\overline{X}$ and R type of chart. The one referred to in Fig. 4 is typical of this type of measurement and control. By the use of this technique, better conditions for fitting and finishing are maintained with attendant economy in production and with greater customer satisfaction. This whole scheme of dimensional control, of course, is but an adaptation of well-known machine shop practice applications.

Checks Can Reduce Scrap—The most common measure of the quality of castings is that of "looking them over" for obvious defects. Of course such inspection is not confined simply to examining the castings just before they are shipped, but in most shops they are inspected also as they progress through the several steps in the operation.

One malleable castings producer reports, for example, placing "fraction defective" charts for scrap on each grinder in the cleaning room, with inspectors checking every machine every hour to see that the castings

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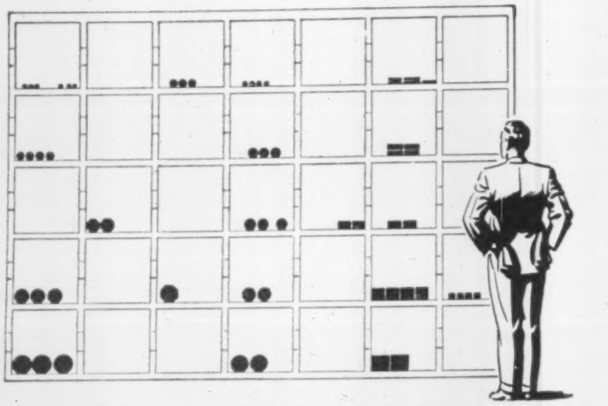

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are being properly ground and to record the scrap. Each inspector is also responsible for checking each box of castings before it leaves the department. After a load has been inspected, the inspector places a small signed tag on it to signify that the load may be moved. In addition, check samples are taken from box loads ready to ship, using an approved sampling plan. If, when checking a sample from a box, one or more defective pieces are found, a second sample is taken. If one or more defective pieces are found in the second sample from a box, one or more declaiming by the operator. The size of the sample and the number of permissible defectives in determined by consulting sampling tables.

As a result of such a sampling scheme, returns and complaints have decreased considerably. In one plant the quality of work was running at about 5 per cent defective, shipped to the customer prior to the use of such a scheme as has been described. After the plan had been in operation for some time, defective pieces had decreased to less than 2 per cent.

Study Historical Trends—In a study of defective castings, it is always desirable to be able to correlate the nature of the defects and the number of castings scrapped for each defect as closely as possible with the production period. As an approach to this, a tabulation can be much of such defective castings by using a report form such as is shown in Fig. 8, especially where the castings can be identified by a serial number or by a heat number. The results can then be plotted, perhaps in the form of a "histogram" such as is shown in Fig. 9, or in the form of a P-chart for each major type of defect. Any such arrangement is of great value in analyzing the nature and occurrence of defective castings and in indicating where corrective measures should be taken.

In any discussion of the fundamental techniques of statistical quality control it should be emphasized that the charts which are being maintained should be posted at locations where they will receive the most attention from those who are concerned with them. Thus charts are posted right at the core machines and at the molding units to show the performance of each unit. Those showing sand properties are posted on a board in the sand laboratory, while the charts for the core and dimensional measurements of castings are posted prominently in the foundry superintendent's office.

One further step that our organization has taken in evaluating the data obtained through such a program is the preparation of a monthly summary report for the works manager, and a summary report at intervals of about every two months by a representative of the research department for the company vice president in charge of operations, and also for the works manager. By the use of these statistical methods, we have a measure for evaluating control steps in the process which is accurate and from which management can obtain a concise picture of the process performance.

Trained Specialist Needed—The size of the quality control organization necessarily will vary with the size of the foundry organization and with the amount of emphasis the management wishes to place on the project. Someone who has training in the fundamentals of the subject and who has considerable interest in the subject should be selected to head up the program for the plant. This should be his job and he should be able to devote his entire time to this particular work.

Such a man will probably do some of the charting work, although he may be able to get others to help out with this part of the work; he will review the charts at frequent, regular intervals, and he will make recommendations as to the corrective steps to be taken. Preferably he should have enough authority to see that these steps are taken, after consultation with the department heads involved. An added virtue that is of untold value to the quality control engineer is that of diplomacy and tact in putting his ideas across both to management and to his fellow workers.

In this discussion we have been attempting to show how this newly developed technique of statistical quality control is being applied in the foundry industry. Even though it is a comparative newcomer, it has already demonstrated its possibilities as a tool which has been variously applied with considerable success. Through its application scrap losses have been lowered, process control has been improved, production rates have been increased, and as result of these improvements processing costs have been lowered—by methods which can be demonstrated graphically to the plant management.

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How solvent detergents provide outstanding benefits in hundreds of industrial cleaning applications is discussed in an illustrated booklet issued by Oakite Products Inc. Booklet reports upon the many classifications of cleaning in which solvent detergents are being successfully used today to perform such tasks as: Removing oily films, smuts, cutting, drawing and stamping compounds from steel in metal fabrication processes, precleaning metal parts and providing a degree of temporary rust protection.

Specific applications are given of solvent detergents in metal fabricating plants, metalfinishing shops, and in railroad, textile and paper mill, power plant, garage, aviation and petroleum industry cleaning operations, and these advantages listed as being provided by their use: Rapid dissolution and removal of heavy soils; fast precleaning action to make subsequent critical alkaline cleaning easier. Solutions may be used at room temperature in most instances; solutions are easy to mix and ready for instant use; tough soils are removed without hurting paint beneath; fire hazards are minimized; rust after cleaning is prevented; and economy since the solutions may be used again and again. Free copies of this booklet may be obtained by addressing Oakite Products Inc., 134 E. Thames St., New York 6.

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Avoiding Galvanic Corrosion

(Continued from Page 83)

One method of alleviation is to insulate electrically the two materials from each other. If bolted joints are used, in order to obtain complete insulation, insulating bushings as well as insulating washers and gaskets are required. Another means of protecting joints between aluminum and dissimilar metals is to paint all surfaces of both metals in the vicinity of the contact area before assembly, and to caulk the joint with a suitable plastic sealing compound prior to assembling the joint. It is not satisfactory to paint surfaces of the anodic material only, since then the attack will be localized at any discontinuities that may be present in the paint coating.

In special cases where it is desired to join tubes of two dissimilar metals, sometimes butt welding can be used. External surfaces at the joint can be protected from galvanic action from condensed moisture by coating them with a rubber sheath. One of the best ways of accomplishing this is to vulcanize the rubber right in place. Butt welded joints are generally superior in resistance to lap welded joints, since it is difficult to prevent the trapping of moisture between the faying surfaces of lap joints. In this case, lap joints have the further disadvantage that it is practically impossible to remove welding flux from the faying surfaces. Therefore, moisture lodging in these areas often becomes highly corrosive by dissolving some of the trapped flux.[6]

Plating Helpful—In certain cases, all areas of a dissimilar metal known to be cathodic to the other metal to which it is to be joined can be plated with a coating of a metal known to have the same potential as the anodic metal. For instance, copper or brass parts which are to be used in contact with aluminum parts can be cadmium plated as a means of reducing galvanic corrosion. Cadmium is similar in potential to aluminum in many neutral solutions. As long as the cadmium coating remains on the copper base part, little or no galvanic attack of the aluminum will occur. Once the cadmium coating is corroded away then galvanic attack of the aluminum will occur.

Sometimes a sacrificial piece of a third metal or alloy can be added to the structure adjacent to the joint between the dissimilar metals in order to protect the anodic structural material. If steel rivets are used in an aluminum structure, washers of zinc attached to the aluminum around the rivet heads will prevent selec-

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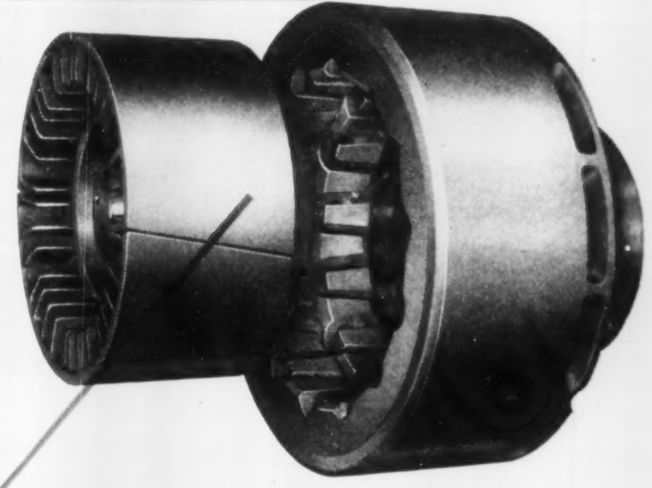

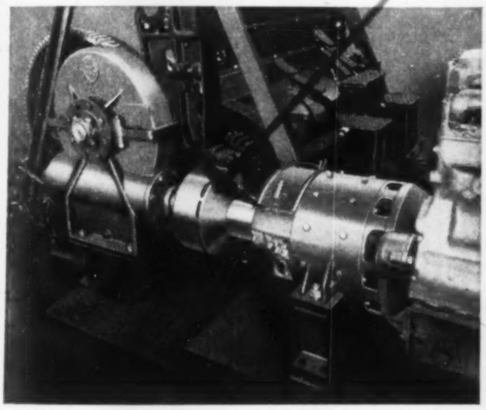

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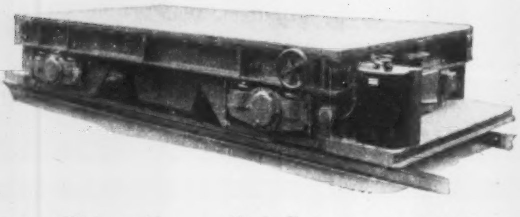

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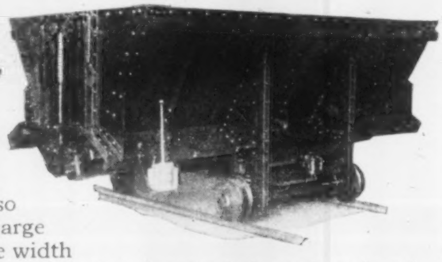

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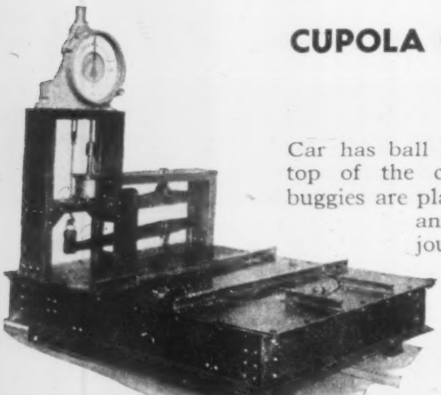
The discharge gates are so arranged as to spread the charge to the best advantage over the width of the furnace. Gates are hydraulically operated through a hand pump. Car is mounted on anti-friction roller bearings with spring mounted journals. Car provided with automatic engine couplers.

CUPOLA CHARGING SCALE CAR



Car has ball bearing steel turntable on top of the car upon which charging buggies are placed and weighed. Car has anti-friction bearings at main journals.

Send for illustrated booklet on all types of intra-plant cars.

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GALVANIC SERIES OF METALS AND ALLOYS

Corroded End (anodic, or least noble)
Magnesium
Magnesium alloys
Zinc
Aluminum 2 S
Cadmium
Aluminum 17 ST
Steel or Iron
Cast Iron
Chromium-iron (active)
Ni-Resist
18-8 Stainless (active)
18-8-3 Stainless (active)
Lead-tin solders
Lead
Tin
Nickel (active)
Inconel (active)
Brasses
Copper
Bronzes
Copper-nickel alloys
Monel
Silver solder
Nickel (passive)
Inconel (passive)
Chromium-iron (passive)
18-8 Stainless (passive)
18-8-3 Stainless (passive)
Silver
Graphite
Gold
Platinum
Protected End (cathodic, or most noble)

In above table, metals that are grouped together have no strong tendency to produce galvanic corrosion of each other, and are relatively safe to use in contact with each other. The coupling of two metals from different groups and distant from each other in the list will result in galvanic, or accelerated corrosion of the one higher in the list. The further apart the metals stand, the greater will be the galvanic tendency. Courtesy International Nickel Co.

tive corrosion of the aluminum under many conditions of exposure. The zinc washers will themselves suffer galvanic attack and may have to be replaced. Chemical treatment of aluminum has been reported to retard galvanic action.[7] The use of aluminum parts also will avoid galvanic corrosion which occurs when dissimilar metals are used.

Crevice Corrosion—Joints are often especially susceptible to corrosion even when both members of the assembly are of the same metal or alloy. In the case of bolted or riveted joints, there are fine crevices between the shank of the rivet or bolt and the hole walls. If liquids can penetrate into these crevices, oxygen concentration cells may be set up which result in special attack of the sheltered areas. For this reason, even where it is not necessary to use any special protection on the freely exposed areas of the metal surfaces, it may be necessary to protect the joints. The simplest protection for outdoor exposure conditions is to prime the joint surface before assembly with a suitable primer. This should be allowed to dry before the joints are assembled. For more severe exposure it is desirable to use a suitable plastic caulking compound.

Another method of preventing crevice corrosion is to coat the surfaces of the metal at and adjacent to the joint with a coating of an anodic metal. This can be done by metal spraying, electroplating, hot dipping or metal cladding (such as use of materials like Alclad aluminum alloys). A result similar to that obtained by coating can be obtained by using a gasket of an anodic metal in the joint. This has the disadvantage that corrosion of the anodic metal may either loosen the joint or cause buckling of the joint plates as a result of accumulation of corrosion products from the anodic metal gasket.

Magnesium Assembly Protection— Galvanic corrosion action between magnesium and other metals can be minimized by proper choice of materials or by insulating. According to Dow Chemical Co., in structures where it is necessary to join another metal to magnesium the best choice of material, in the order in which each is preferred, is 56S, 52S, 53S, or 61S aluminum; or zinc-plated, zinc-dipped, or cadmium-plated steel.[8] All bolts, washers, nuts and self tapping screws should be cadmium plated, zinc plated or galvanized.

When magnesium is assembled in contact with magnesium, both faying surfaces should be primed with two coats of zinc chromate primer conforming to Army-Navy specifications AN-TT-P-656.[9] After assembly the entire structure should be painted with a recommended paint system. Anodized 56S aluminum rivets are preferred for riveted structures as they minimize corrosion. If other than 56S rivets are used they should be dipped in zinc chromate primer before driving. The same principle of joint protection shown for riveted joints applies to other types of joints.

More Protection Needed — Additional protection against galvanic corrosion should be supplied when magnesium is assembled in contact with dissimilar metals or wood. Under these conditions each faying surface should be given three coats of zinc chromate primer before assembly. A sealing compound or gasket material should also be used to further insulate the surfaces. If sealing compound is used, the excess material squeezed out during assembly should be filleted or beaded to protect the edges; if a gasket material is used it should extend far enough to prevent water from bridging.

Gasket materials are preferred for joints which must be disassembled frequently. If rivets are used they should be 56S aluminum; bolts, nuts, and washers should also be aluminum if possible, otherwise cadmium plated and Bonderized steel is preferred. After assembly the entire structure should be painted with a recommended paint system.

In the case of magnesium to steel

PRECISION

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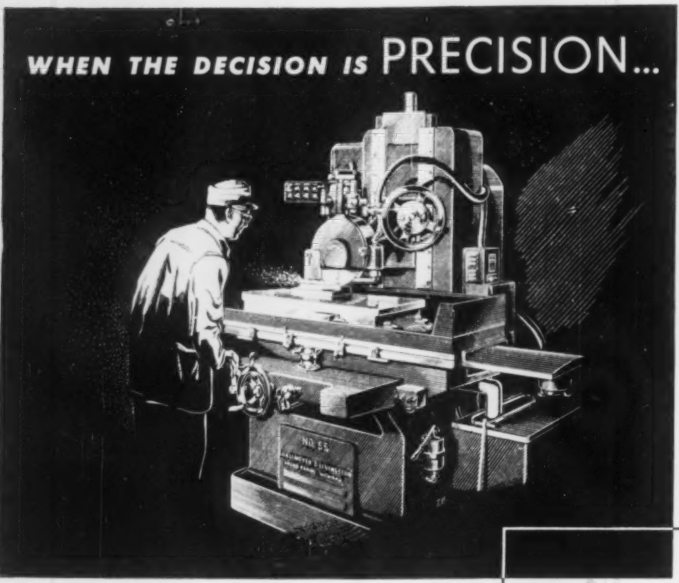

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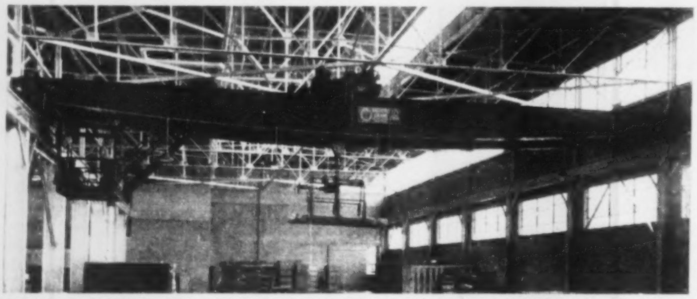

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joints in structures exposed to atmospheric corrosion, in conditions typical of use in truck bodies, Dow Chemical Co. recommends that the magnesium be given two coats of zinc chromate primer, or one coat of primer and one finish coat; the steel must be both primed and painted unless it is cadmium or zinc plated. The two surfaces must be separated by a suitable gasket made of tape or sheet material. In all cases the gasket should extend a sufficient distance outside of the joint to minimize the effects of wet mud or wet insulation bridging the gap between the steel and the magnesium.

All inserts used in magnesium should be cadmium plated. If service conditions will be severe, recommended practice is that an annular groove ⅛-inch or wider be provided and filled with caulking compound. This groove preferably is formed by machining the insert, but usually the small size of the insert makes it necessary to counterbore the hole in the magnesium. Inserts in locations where they become well covered with grease or oil during service need no special protection.

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Vacuum Calculations Simplified

An edition of the Stokes vacuum calculator is available for free distribution. The slide rule, designed for quick calculations in vacuum research and processing work, was developed by F. J. Stokes Machine Co., 5900 Tabor Rd., Philadelphia 20.

It will determine the needed pump capacity to evacuate a given volume to a specified vacuum in a given time, and the time required to reach a specified vacuum in a given volume with a pump whose capacity is known. It will also determine vapor pressures of water at various temperatures, and capacities of round tanks in both cubic feet per foot and gallons per foot. On the reverse side of the rule there are useful conversion tables.

Cherry Rivet
Townsend

Townsend Acquires a New Division for Broader Service to You

When Townsend Company purchased the Cherry Rivet Company, two great names in the fastening industry were combined.

Townsend is the world's largest manufacturer of rivets and has specialized in wire drawing and cold heading during its 135-year history. The Townsend plants in the Pittsburgh and Chicago districts produce, in addition to rivets, a wide variety of special nails, self-tapping screws, locknuts, gadgets, small parts and other cold headed items. Sixty-million of these items can be produced every working day by Townsend.

Now, the experience and size of Townsend is being augmented by the special skills and manufacturing facilities of its Cherry Rivet Company Division in Los Angeles. These skills were developed in perfecting a blind rivet that could be installed from one side of the work without the necessity of "bucking up" as with standard rivets. Since its inception in 1937 the Cherry blind rivet has been used extensively in aircraft, railroad cars, buses, truck bodies, trailers and major appliances. The Cherry line includes blind rivets, blind bolts, drive pin rivets, lock bolts, utility rivets and special tools for installing them.

This merger brings you the benefit of combined manufacturing facilities plus the accumulated experience gained by both organizations in pioneering the solution of a multitude of fastening problems. All this adds up to better and broader service to you.

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New plant space is expensive. That is why the Hevi Duty vertical retort furnace should fit into your program of expansion of production heat treating facilities. It is economical—turning out tons of work in a minimum floor space, flexible—the same furnace can be used for most major heat treating operations such as Carburizing, Nitriding, Dry Cyaniding, Bright Annealing and Clean Hardening. Information which will interest you is in Bulletin HD-646—send for it—today

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Plan Increases Battery Life

M. W. Heinritz, vice president, Gould-National Batteries Inc., Trenton, N. J., announces Gould's new "Plus-Performance Plan." The plan is devised to help industrial battery users get the maximum power and life from their batteries for extra defense production during lead cutbacks.

The plan consists of an integrated conservation program based on applicable charts, manuals and articles pertaining to particular users' problems. Users informing the company of their interest will get, without obligation, material that will be of most help in their particular case.

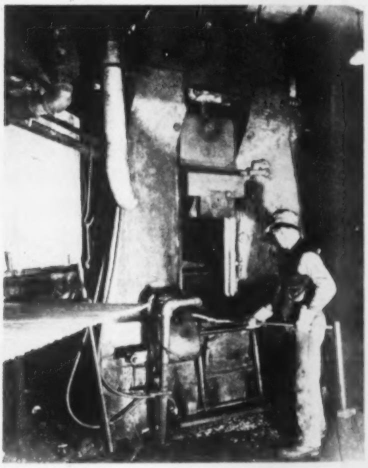
He points out that it has been estimated that battery performance can be improved as much as 50 per cent if four major rules are practiced properly:

Selection—Buy batteries to fit the job. Purchase of oversized or undersized batteries wastes man-hours, money or materials.

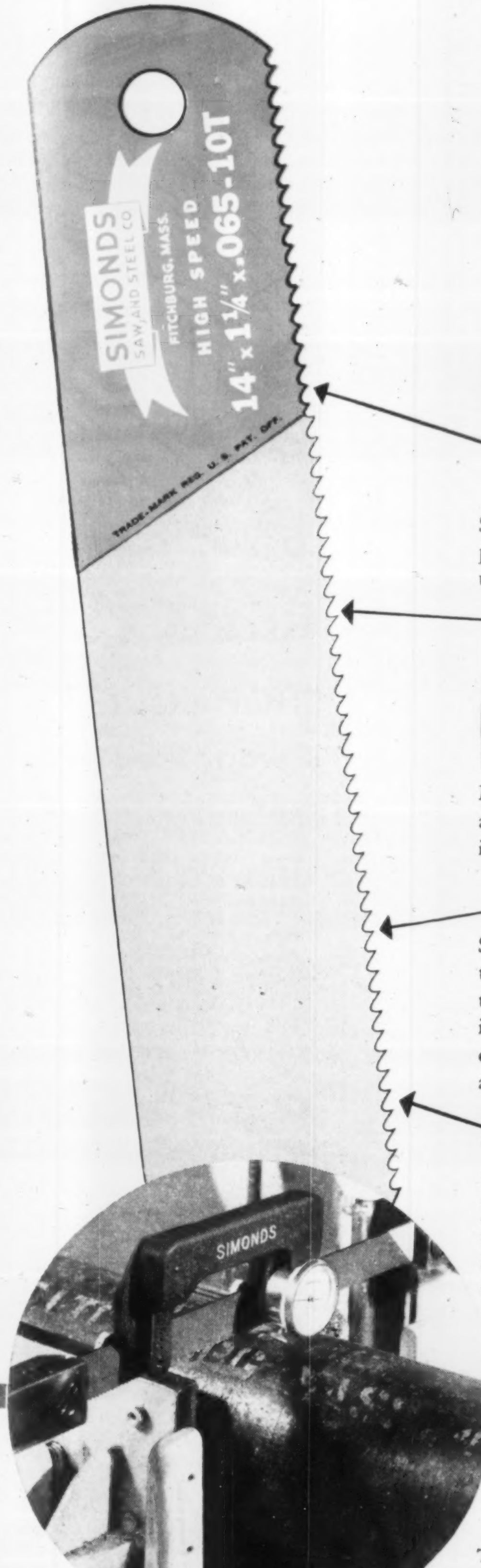
Charging and Handling — Charge batteries correctly. Watch the rates of initial and finish charges. Equalize when necessary. Install batteries correctly. Connect them properly. Ventilate adequately. Handle according to printed instructions.

Maintenance — Maintain batteries systematically. Organize a fool-proof

More Forgings for West Coast



SIZE of precision forgings available on the West Coast is getting a big boost since Arcturus Mfg. Corp., Venice, Calif., installed a 5000-pound Ceco drop hammer complete with trim press and furnaces. The firm is the only western manufacturer of forged parts for the Ford Motor Co. and is a large supplier of forgings to the aircraft industry

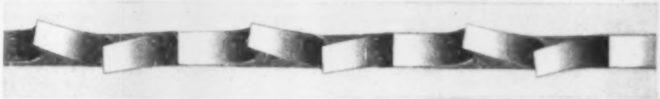


SEE WHAT SIMONDS offers in these famous "RED END" Hack Saw Blades

ACCURATELY MILLED TEETH

Simonds Design Tooth Shape, maintained by accurate milling, provides perfectly formed teeth of exact height. This distributes wear evenly to all teeth with resultant longer cutting life.

PRECISION SET TEETH



Machines of advanced design set the teeth to exacting tolerances. This not only provides adequate clearance but results in straighter cuts throughout the life of the blade.

UNIFORM HARDNESS

Simonds Method of Heat Treating produces uniform hardness throughout the length of the blade unapproached by conventional heat treating methods. As a result, there is no variation in the grain structure of the steel and the teeth hold a cutting edge longer. This means consistently better cutting performance and low cutting costs.

A "RIGHT" BLADE FOR EVERY NEED

Simonds High Speed, Molybdenum, and Standard Steel Blades provide a "right" blade for every job — hand or power. All standard sizes are available from stock through your local Simonds Distributor. Consult the Classified Telephone Directory under "SAWS" or write the nearest Simonds Branch.

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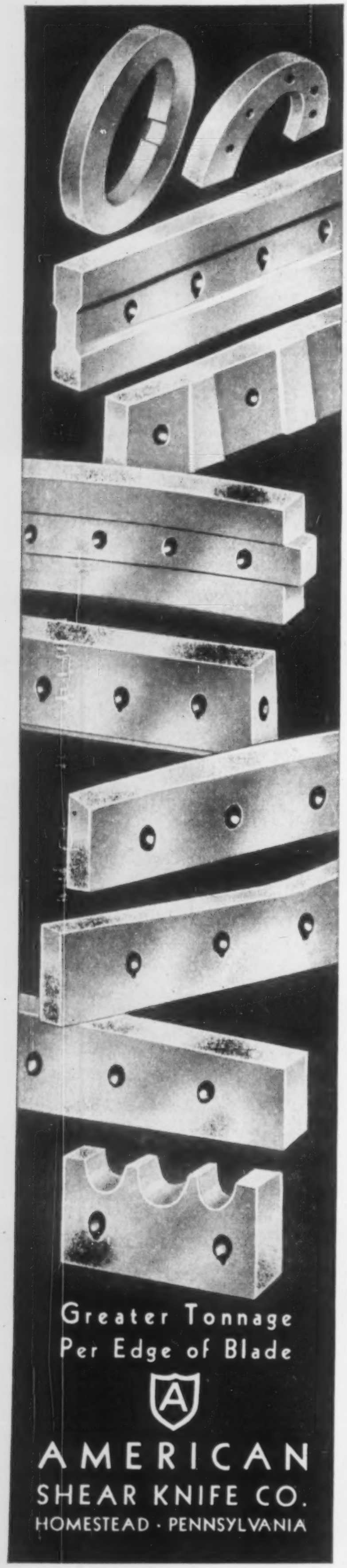
Get Correct Blade Tension with a "SIMOMETER"
Take the guesswork out of hack saw tensioning with a SIMOMETER — the easy, modern way to insure correct blade tension and get straight cuts, faster cuts and more cuts per blade. Ask for a SIMOMETER demonstration and see for yourself how it can make your hack saw dollars go farther.



maintenance program. Tighten loose connections and replace worn cables. Use batteries within designed capacities. Over-discharge cuts down performance.

Determination of Condition — Test batteries regularly. Keep a record of cell readings. Know the conditions of batteries at all times. Replace batteries when necessary. Knowledge of battery condition permits ordering far enough ahead to assure continuous service.

Insert Pares Maintenance Costs

A new application of the Rosan insert which prolongs the life of the carriage slide and reduces maintenance costs on Brown & Sharpe automatic screw machines was developed by Pacific Screw Products Corp., South Gate, Calif. For some time company engineers have been wrestling with the problem of eliminating needless expense in replacing the carriage slide whenever the tapped hole securing the turret locking-pin lever stud for some reason has become stripped.

Recent tests, consisting of retapping the hole and installing a Rosan insert to restore the internal thread diameter to its original dimension, proved as satisfactory as the original fitting. When the internal thread again becomes stripped, the insert is machined from position and replaced with a new insert. Officials predict this application will save the company thousands of dollars normally expanded for carriage slides each year.

Powdered Cores Standardized

All of the types of electronic cores made from iron powder and commonly in use by the radio and television industry have been listed in a standard just released by the Metal Powder Association. The standard was prepared by the electronic core subcommittee of the association's standards committee to meet a long felt neer in the electronic core industry for standardization of the dimensions and tolerances relating to electronic cores.

It is designated 11-51T and defines the terms commonly associated with electronic cores made from powdered magnetic materials and specifies the preferred dimensions of standard sizes and shapes. Preferred dimensions are listed in detail for plain iron cores, insert iron cores, threaded iron cores, tuning cores and sleeve iron cores. In addition to diameters and lengths, data are provided for concentricity, screw driver slot dimensions, hexagonal hole sizes as well as threaded

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spring type and spaded insert sizes. Copies are available from the association at 420 Lexington Ave., New York 17, at 25 cents per copy.

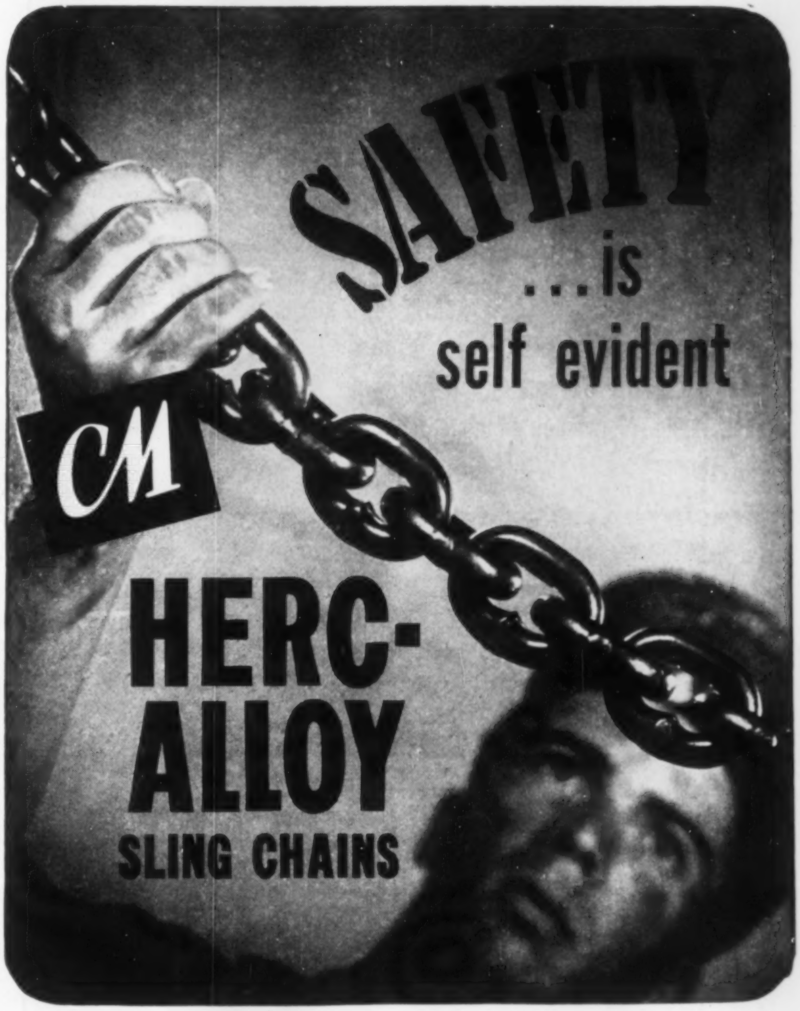
Miller Gets Phenolic Slide Liners

One of the problems that has plagued machine tool manufacturers for many years, particularly builders of heavy equipment, has been the scoring and wear of bearing slides, and consequent loss of accuracy, which results from the constant movement of heavy masses. This problem is overcome in the Keller type BG-22 built by Pratt & Whitney, West Hartford, Conn., through the use of phenolic liners on all slides, thus eliminating the troublesome iron-against-iron bearing surfaces normally encountered.

Laminated phenolic plates, sliced edgewise for end-grain surface, are fastened to the slides of the column base, vertical slide and spindle head, the movement of which provide the horizontal, vertical and transverse motions of the machine. These plates are pinned securely to the castings with phenolic pins and the surfaces are then planed and precision scraped to their mating slides to the same limits of accuracy as were the previous cast iron bearings. The lead screws which drive these heavy members are also protected by phenolic,

Tube Network Supplies Prints

DELIVERIES of blueprints from the central station to outlying technical departments by a 1-1/3-mile pneumatic tube system at a speed of 20-25 feet per second effects important savings in time and money at a western plant. As many as 15 copies of a given print were required in the past. Only two prints are needed now, one on call and the other on reserve. Lamson Corp., Syracuse, N. Y., designed and installed the system consisting of a 3 x 12-inch tube network reaching from the central blueprint station to six substations



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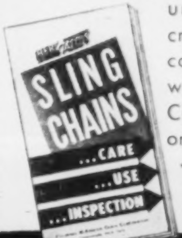
● A simple visual inspection* is all that is needed to determine the continued serviceability of a HERC-ALLOY Chain. That's why more and more of the important companies are standardizing on HERC-ALLOY... because HERC-ALLOY Chains are immune to unseen dangerous crystallization... because you can **see** when a HERC-ALLOY Chain needs repairs or replacing.



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FOLLANSBEE COLD ROLLED STRIP is production-line steel strip with machining characteristics suitable for freezers or furniture or fixtures. Regardless of the forming operation involved, the continuous feeding of Follansbee Cold Rolled Strip from coils saves time and labor and material.

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the nuts being molded of phenolic material, giving a positive contact fit that will not ordinarily pick up and freeze.

Exhaustive tests, performed over a period of several years, have shown that bearing surfaces of phenolic against iron or steel will not cut or score the slides and lead screws and with proper lubrication should prolong the bearing life almost indefinitely. Besides the non-scoring and extremely good wearing characteristics of phenolic, it also has a heat-insulating quality which is important for high speed operation under heavy weight.

Mechanical Lab Expands

Mounting demand for research in the field of mechanisms has forced Southwest Research Institute to provide new and larger quarters for its mechanical laboratory at San Antonio, Tex., C. Desmond Pengelley, chairman of engineering mechanics, has announced.

Under the direction of Charles E. Balleisen, research specialist in automatic machinery and kinematic synthesis, the new laboratory, now being fully equipped, is set up to make basic determinations of strength, dimension and motion, and to study industrial machinery and manufacturing processes.

To perform this work, the laboratory equipment includes a high speed motion picture camera capable of exposing 8000 frames per second, various types of static and dynamic testing machines, and precision measuring instruments accurate to millionths of an inch.

Plug Valve Manual Available

A manual packed with piping, wiring, mounting, and installation data for power operated Nordstrom lubricated plug valves is being issued by the Rockwell Mfg. Co. This bulletin is a complete compilation of technical data covering the use of pneumatic, hydraulic, and electric operators for lubricated plug valves. Included are typical piping diagrams, arrangements for both side and top mounted motor controls, closing speeds, wiring data and an extensive group of photos of actual installations in a variety of industries.

Trend toward power operated valves has grown rapidly in recent years in the petroleum, gas, chemical and process fields. The use of power controls minimizes the human element in plant operation, reduces operating costs, permits flow control from remote points, makes timed-cycle operations easy and is a factor

1·8·16 OR MORE!

'Surface' CONTROLLED ATMOSPHERE . . .

PIT-TYPE FURNACES

. . . in Modern Production Plants

A battery of 16 (12 shown) Pit-Type Furnaces used for carburizing roller bearing parts.

Can be used for . . .

- ★ GAS CARBURIZING
- ★ HOMOGENEOUS CARBURIZING
- ★ DRY (GAS) CYANIDING
- ★ CLEAN HARDENING
- ★ BRIGHT ANNEALING

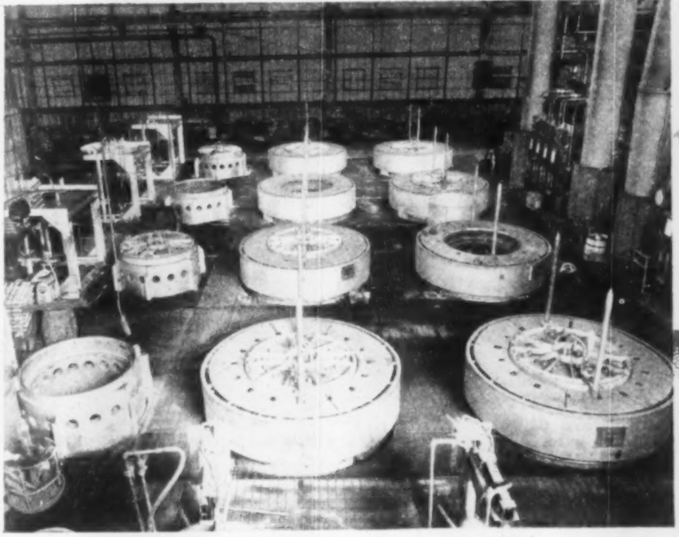
These Features make them OUTSTANDING:

✓ **EXTERNAL OR INTEGRALLY-BUILT RX ATMOSPHERE GENERATOR •** Pit-Type furnaces are used with the various 'Surface' atmosphere generators. For example, an RX Generator may be built integrally with the furnace, or one or more furnaces may be manifolded to a 'Surface' RX, DX, or NX Atmosphere Generator.

✓ **BASKET OR FIXTURE LOADING •** Small parts can be mass-loaded in a basket and lowered into position in the pit-type furnace. Long, irregular parts may be suspended from a fixture for minimum distortion to parts during heat treatment.

✓ **RADIANT TUBE HEATING •** With the 'Surface' Radiant Tube heating principle, no muffle is required—there's no contamination of the furnace atmosphere with products of combustion — no muffle replacement — more floor space is available—there's economy in operation. 'Surface' Pit-Type Furnaces are built in effective pit sizes up to 4 ft. wide by 8 ft. deep, and larger.

RX, NX AND DX ARE TRADE MARKS OF SURFACE COMBUSTION CORPORATION



A battery of 8 Pit-Type Furnaces used for carburizing cam shafts in an automotive plant.

'Surface' Pit-Type Furnaces are adaptable to special runs of a diversity of materials and heat treatments. Especially fitted to areas where floor space is limited and size and shape of parts are unusual.

The outstanding performance of the many 'Surface' Pit-Type Controlled-Atmosphere Furnace installations is your assurance of consistent satisfaction.

More complete details are given in this new Bulletin SC-149. Write for your copy today!

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'Surface' INDUSTRIAL FURNACES

FOR: Gas Carburizing and Carbon Restoration (Skin Recovery), Homogeneous Carburization, Clean and Bright Atmosphere Hardening, Bright Gas-Normalizing and Annealing, Dry (Gas) Cyaniding, Bright Super-Fast Gas Quenching, Atmosphere Malleableizing and Atmosphere Forging. Gas Atmosphere Generators.

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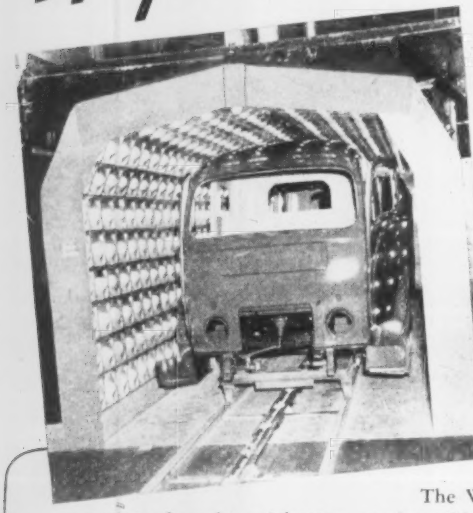
Highest Efficiency



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Read These Results Typical of Thousands of FOSTORIA INFRA-RED INSTALLATIONS

The White Motor Co., Cleveland, experienced such satisfactory results with the initial installation of Fostoria Infra-red ovens in 1942 that additional installations have been made whenever new baking and drying equipment was needed. White now has 17 Fostoria Infra-red ovens. The photo above shows one of 3 ovens used for drying off after bonderizing and for baking prime and finish coats. The dry-off oven is 18′ 4″ long and the two paint baking ovens are both 29′ 4″ long. Baking of paint on White 3000 series Power Lift Cabs is done in nine minutes. Electric operating cost is reasonable—dry-off oven 135 KW, prime oven 144 KW, finish oven 128 KW.

Throughout industry, new high standards of production efficiency are being set by utilization of the Fostoria Infra-red System. Savings in space, time and manpower with many additional advantages result in substantially lower "per piece" production cost. Whatever your baking, drying, degreasing, or industrial heating problems may be, investigate the high efficiency available in Infra-red ovens as engineered by Fostoria.

SAVES SPACE

Fostoria Infra-red ovens operate on a comparatively short cycle which results in smaller oven requirements. They may also be suspended from ceiling mounts to eliminate floor space entirely.

SAVES TIME

Reduces processing time from hours to minutes because of the inherent speed of Infra-red. There is no time lag in starting an oven, the heat is instantaneous.

SAVES MANPOWER—MANHOURS

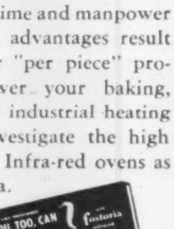
Ideal for conveyorized production methods. Reduces excessive product handling. Turns out more pieces per day with ease, with less people.

CUTS COSTS

Faster production, lower operating costs, improved quality, result in lowest "per piece" cost.

GET THE FACTS ON FOSTORIA "KNOW HOW" HELP TO REDUCE YOUR "PER PIECE" PRODUCTION COST

Write, today, for this factual information on this Infra-red process and equipment as engineered by Fostoria. Technical data applicable to your operations will be included if you send us general facts about your particular problem. A Fostoria representative will gladly analyze your production needs and submit definite recommendations and carefully forecasted results for your consideration.



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FOSTORIA, OHIO
Oldest and Largest Manufacturers of Industrial Infra-red Ovens

INFRA-RED fostoria SYSTEM

for greatly increased safety. Copies of bulletin V-214 can be obtined by writing to Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8.

New Oil for Sendzimir Mills

To meet the unique demands of the Sendzimir precision cold strip rolling mill for a combination bearing lubricant and roll oil, a new dual-purpose oil named Roltex has been developed and marketed by The Texas Co.

The versatile new lubricant underwent considerable laboratory development after studies of a variety of Sendzimir mill installations and applications revealed that it would have to perform these two essential functions: Lubricate antifriction bearings, and act as a coolant for the strip while preventing "heat streaking."

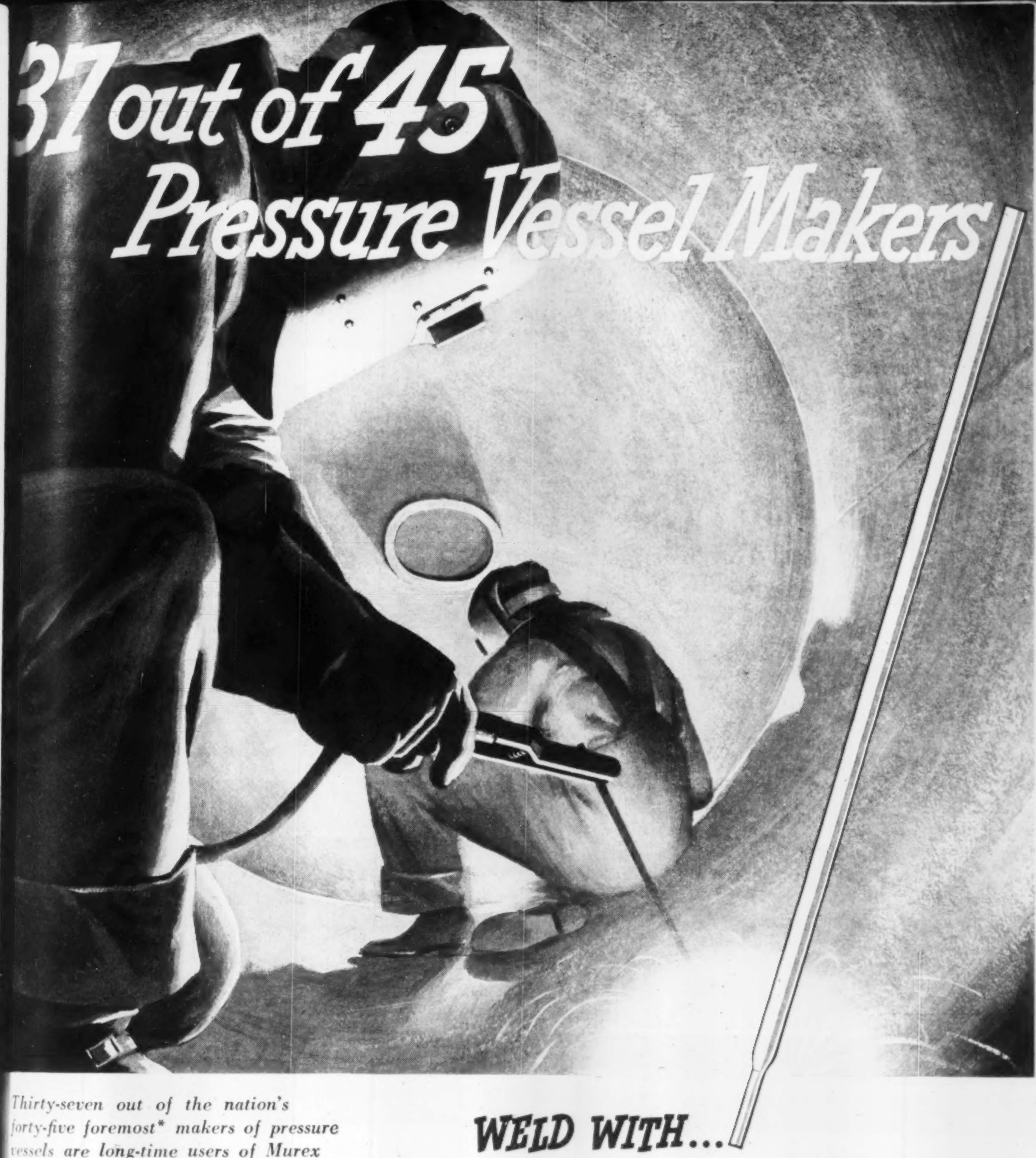
Roltex oil incorporates the following characteristics necessary to the efficient operation of a Sendzimir mill:

The new oil has a well-balanced film strength which permits proper lubrication of the heavily loaded antifriction bearings without eliminating the essential friction necessary to the rolling operation. It also acts as a coolant on the strip during rolling, is nonstaining to the metal, provides rust protection during shutdowns, does not fog or foam, is oxidation resistant, and has a viscosity which permits easy removal by the rubber scraper.

Robots Taking Over

Electronic robots with superhuman intellects will gradually take over the automatic control of more and more of America's industrial processes during the next 20 years. Scientists of the Raytheon Mfg. Co., Waltham, Mass., at its annual sales convention, in stressing the importance to national security of electronic aids to industry, revealed the development of an electronic memory device that stores information 1000 times faster and provides a storage capacity 400 times greater than any mechanical card filing system in use today.

While the electronic memory equipment was developed as part of a project undertaken for the armed forces, its functions are equally applicable to the automatic control of a wide variety of peacetime industrial processes. Ernest F. Leathem, assistant to the president, pointed out that while much of Raytheon's production today is for the armed forces and of a secret nature, the company has also many commercial products—such as radar aids to navigation



Thirty-seven out of the nation's forty-five foremost makers of pressure vessels are long-time users of Murex Electrodes.*

In this industry, welding electrodes must provide high quality weld metal to meet rigid code requirements — must have high deposition rates to assure economy of production. These are two characteristics for which Murex electrodes are noted.

*Those having AAAA directory financial ratings.

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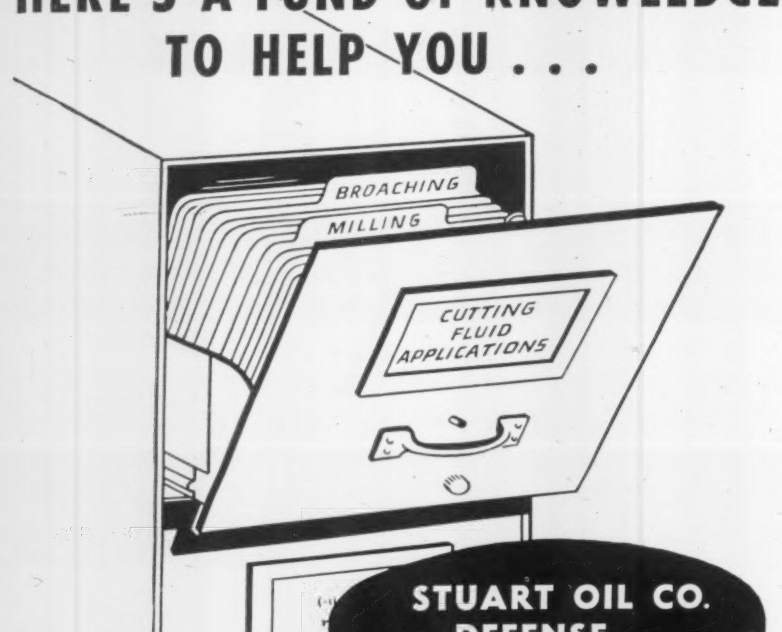
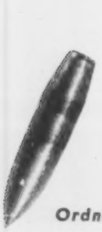
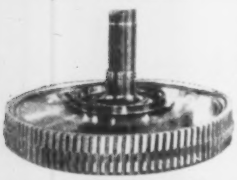
TO HELP YOU . . .

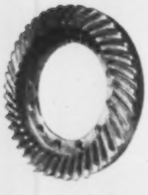

BROACHING
MILLING
CUTTING FLUID APPLICATIONS
STUART OIL CO. DEFENSE PRODUCTION EXPERIENCE



Ordnance



Aircraft



Transportation

DEFENSE production spells tougher materials and new materials such as high temperature alloys and super stainless steels. Such metals and the tolerances and finishes required by Armed Services specifications bring new problems to plants experienced in civilian production.

D. A. Stuart Oil Co. has a tremendous backlog of experience in helping solve defense machining problems through correct application of the proper cutting fluids.

This fund of information, preserved and developed, is available to help you if you are engaged in defense work.

Use Stuart as your clearing house for helpful information.

WRITE TODAY, or call our nearest office outlining your specific problems.

D. A. Stuart Oil CO.

2735-37 S. Troy St., Chicago 23, Ill.

underwater sound devices and ship-to-shore communication equipment—which, by their nature, serve an important function in the nation's defense program.

"Cocoon" Protects Idle Tools

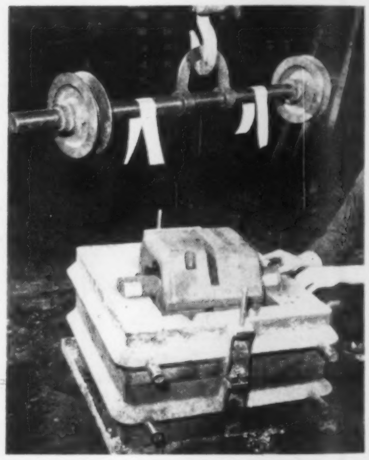
Industry has been advised to take a page out of the armed forces' book and put its unused valuable civilian production equipment in "mothballs" until the present defense emergency is over.

The proposal came from R. A. Guyer, vice president of DeVilbiss Co., spray equipment manufacturer, of Toledo, who stated that spraying a weather-tight, cocoon-like covering over temporarily unneeded equipment or machines, for the "duration", is actually a low-cost, easy method of protecting such facilities against rust, rot and ruin.

Much military equipment from World War II was kept in top battle condition in this manner, particularly the Navy's famed "Mothball Fleet."

Only four steps are required to make a protective "cocoon", he added: Place cloth tapes over equipment to form a lattice-like framework, spray a webbing material between

Tape Eliminates Lifting Eyes



SCOTCH tape made by Minnesota Mining & Mfg. Co., St. Paul, is used to eliminate the need for lifting eyes or straps with heavy sand cores in foundry methods experiments at the University of Minnesota. Used for handling sand cores weighing up to 150 pounds, the tape is attached from an overhead gantry to the core's prints and back on itself. After the core is positioned and seated in the mold, tape is cut and loose ends are stuck to the print. Since tape is placed only on the prints, molten metal does not come in contact with the tape during casting tapes, spray a sealing material over the webbing; and insert silica gel to absorb moisture.

A window can be put in the cocoon for inspection or replenishing the silica gel container. Once the emergency is over, the cocoons can be ripped off and the equipment will be ready to again turn out civilian goods, he concluded.

Management Courses Offered

College of Engineering, State University of Iowa, Iowa City, will offer its 12th summer management course for factory managers, foremen, industrial engineers, methods and time study analysts and office executives June 11 to 23. Included in the course are: Production planning, job evaluation, motion and time study, wage incentives, plant layout and related subjects. Purpose of the course is to: Provide full understanding of fundamentals, demonstrate ways of instituting training programs in factories and offices, provide instruction in organizing and presenting ideas orally and provide opportunity for discussion of problems common to varied industries.

Individuals enrolled in the program may arrange their subjects to best meet their needs but public speaking in business, management techniques roundup lectures and luncheon club and dinner meetings are made available for all registrants. Instruction in the various subjects will be handled by faculty members and recognized experts in their fields from industry.

Staplers Get Tough Threads

Because helical-wire thread inserts increase the loading strength of threads in light metals, and thereby lessen stripping possibilities, Staplex Co., Brooklyn, N. Y., has specified them as original manufacturing components to solve a problem of stripped threads in its automatic stapling machines.

Four rubber suction-cup legs screwed into the bases of lightweight castings permit the machines to cling firmly to any flat surface and allow easy relocation of the machines when necessary. On the prototype model, the four 6-32 mounting threads in the casting stripped when the machine was rocked to break the vacuum.

To prevent the stripping of these threads on production models, 6-32 stainless steel Heli-Coil thread inserts made by Heli-Coil Corp., Long Island City, N. Y., are installed in these holes. Installation is as follows:

he's free of concern...
his plant won't burn

Going home . . . relaxing after a day of high-geared activity is no trouble for this executive! His mind's at ease about fire . . . a short circuit, a stray spark, a forgotten cigarette or spontaneous combustion . . . all these and many more are definitely under control 24 hours a day, thanks to efficient, quick-acting C-O-TWO Fire Protection Equipment.

You, too, can have this same peace of mind . . . this same positive protection from costly fires by installing complete, approved C-O-TWO Fire Protection Equipment. For instance at many locations, with today's high costs and delayed replacements, a C-O-TWO Combination Smoke Detecting and Fire Extinguishing System is a "must." The first trace of smoke in a protected area sounds an alarm . . . then fast, clean, non-damaging, non-conducting carbon dioxide blankets the fire, putting it out in seconds, before it spreads and causes extensive damage . . . no after-fire mess, no water damage with carbon dioxide.

Also, C-O-TWO Portable Fire Extinguishers . . . either carbon dioxide type or dry chemical type . . . render fast, positive action for extinguishing fire during the incipient stage. C-O-TWO Portable Fire Extinguishers are designed to take abuse . . . rugged construction, no extra gadgets protruding or complicated operating parts . . . built to rigid specifications to assure you of lasting, efficient fire protection.

Remember . . . you can't put fire off . . . fire doesn't wait! For expert advice, let a C-O-TWO Fire Protection Engineer help you in planning complete and up-to-date fire protection facilities now. Write us today for complete free information . . . our experience is at your disposal.

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Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems
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SIMONDS
ABRASIVE CO.
grinding wheels

This guy got a big hand!

He came to the rescue when rejects were mounting. He suggested changing to a Simonds Abrasive Company grinding wheel. It did the trick . . . because it was right in grain and grade for the job. Find out about these efficient production tools . . . part of a complete line including grinding wheels, mounted wheels and points, segments and abrasive grain . . . quality controlled products made by Simonds Abrasive Company, a major manufacturer of grinding wheels for almost 60 years. Write for free data book and name of your Simonds distributor.

SIMONDS
ABRASIVE CO

SIMONDS ABRASIVE CO., PHILADELPHIA 37, PA. BRANCH WAREHOUSES: CHICAGO, DETROIT, BOSTON
DISTRIBUTORS IN PRINCIPAL CITIES

Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

Four holes are drilled with 0.140-inch diameter drills; threads to accommodate the inserts are tapped with special 6-32 taps; and 6-32 thread inserts are installed with inserting tools.

Threads in the insert lined holes can safely withstand 20 to 30 per cent higher loads than unprotected tapped holes because of better load distribution. The spring-like coils of these inserts automatically adjust themselves to both the receiving threads in the castings and the threads on mating parts.

Instead of the conventional 50 to 60 per cent thread flank engagement between threaded members and receiving threads, helical-wire thread inserts provide flank engagements of about 80 per cent. In addition to the resultant higher loading strength, the physical properties of the 18-8 steel used in the manufacture of these thread inserts are such that wear from repeated assembly and disassembly is practically negligible. Also, possibility of corrosion, galling and seizure is eliminated.

Belt Maintenance Chart Offered

Because of the importance of power transmission today, Cling-Surface has made available to industry an exclusive poster chart on the care and maintenance of power-driven belts.

These charts present through simple schematic pictures and words the

Press Squeeze Expressed in Tons

TONNAGE indicator mounted on right of press is a development of National Machinery Co., Tiffin, O., and will become standard equipment on Maxipresses. Advantages claimed for the device are: Forging to closer tolerances without danger of over-load, simpler selection of the proper size press for the job, faster die setup and any variation in press loads gives quicker warning of low heats, improper die setups or incorrect die impressions on the part

STEEL THE VEHICLE OF DEFENSE

Without steel there would be little or no movement of men and material . . . there would be little or no defense.

For, largely from steel come the vital cargo ships and the transports; the landing barges, colliers, hospital ships and naval craft of all kinds.

To give wings to this work the steelmakers of the nation are currently going "all out"—building new mills, increasing the output of present facilities, setting for themselves production goals that, in previous years, would have been considered impossible.

America needs *more* fast seagoing cargo ships and other naval craft. Weirton Steel Company, pledged to participate in defense measures in any way and to any required degree, is supplying steel on approved allocation to expedite the plans and programs for increased naval might.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

The CRACK that DIDN'T cause catastrophe!

When the massive hook for this huge hoist was made it contained a flaw—an imperfection that *could* have caused disaster if not discovered in time—a tiny crack, too minute for human eyes to see.

Inspection with Magnaflux found it—and the faulty hook was repaired *before* it had a chance to fail.

Magnaflux shows up defects in a wide variety of materials—the modern, scientific way. It *instantly* exposes cracks and defects in metals—even when hidden beneath the surface! Magnaflux is low in cost—non-destructive—*and so fast that it detects defects at production line speeds!*

What Magnaflux is, and how it saves money and lives, is described in booklet, sent on request without obligation. Write for your copy.

MAGNAFLUX

detects defects

MAGNAFLUX CORPORATION
5912 Northwest Hwy., Chicago 31, Ill.
New York • Dallas • Detroit • Cleveland • Los Angeles

steps to be taken in the care, maintenance and treatment of all power-driven belts. As there is no such information offered anywhere, the charts thus fill a long-felt want—and one especially needed during today's emergency to conserve critical materials and essential manpower.

Plants, shops and all others who use power-driven belts can have these charts, free, by writing Cling-Surface Co., Buffalo, or from their local industrial wholesale jobber, mill supply distributor, hardware or retail implement dealer.

Black Oxide Finishes Reviewed

Helpful data on materials and procedures that produce the chemically clean surfaces required for black oxide finishing of metals is presented in a special service report available from Oakite Products Inc. After first stressing the importance of proper preparation of metal surfaces to assure consistent, uniform, non-mottled coatings, the report reviews in detail recommended materials and methods for performing the following preparatory operations before black finishing: Alkaline cleaning of ferrous metals to remove light soils, solvent cleaning where heavier soils must be removed, electrocleaning ferrous metals to remove carbon smuts and other coatings, rust and scale removal, controlling acid solutions when pickling iron and steel, tank-cleaning of nonferrous metals and electrocleaning nonferrous metals. Formulas for using the materials recommended for these operations are specified in each instance.

A special section describes how a hot-oil bath treatment for black-oxide coated parts not scheduled for organic finishing enchances the black finish and provides effective antirust protection. In conclusion, the report reviews materials and methods for stripping black finishes from iron and steel and nonferrous rejects. Copies may be secured from Oakite Products Inc., 134E Thames St., New York 6.

New Wrought Iron Bulletin Out

Containing the most frequently required data on wrought iron pipe is a new 4-page bulletin published by A. M. Byers Co., Pittsburgh, to assist technicians in their design and specification work.

Consolidated tables list size and dimensional data for both standard and extra strong pipe. These tables contain complete information on threads per inch, mill test pressures, circumference, external areas, length per square foot of surface area, length per cubic foot of volume, gal-

All at one time . . . it removes rust, removes oil, prepares the metal for painting

NEW
Metal Cleaner
does 3 jobs
in One operation
OAKITE
Compound
No. 33

This FREE Folder Tells About Oakite's Great New Pre-Paint Cleaner

OAKITE Compound No. 33 is a cleaning-phosphating material that simultaneously removes oil and rust and conditions the metal surface for painting.

It also removes heat scale and other oxides, carbon smut, soldering and welding residues, identification inks and other soils from steel, cast iron, aluminum sheet and castings.

Oakite Compound No. 33 is a great soak cleaner for metal parts of moderate size; and great for hand-swabbing on large pieces like cabinets, desks, doors and truck cabs.

Oakite Compound No. 33 saves money; *frequently eliminates pickling operations on moderately rusty steel.*

FREE Write to Oakite Products, Inc., 34E Thames St., New York 6, N. Y., for your copy of Folder F7993 on *"Oakite Compound No. 33".*

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

Technical Service Representatives Located in Principal Cities of United States and Canada

lons per lineal foot, and weight of water per lineal foot. Consolidated, this incorporates the general data needed, for heating, flow and weight calculations. All official specifications for wrought iron are listed in the bulletin.

Chemical composition, properties, general applications and special applications of the material are condensed into one page. Also included is a radiant heating conversion chart and a formula for use in designing snow melting systems.

Copies are available from Byers' Engineering Service Department.

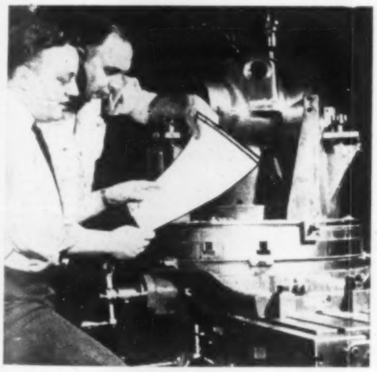
Cooler Hot Metal Crane Cabs

All hot metal handling cranes at the new Fairless plant of the U. S. Steel Co. are to be equipped with Lintern Aire-Rectifiers.

These are of the split system type: The condenser is located at any convenient place on crane and evaporator (cooling coil) is placed in cab. The two units are connected with refrigerant lines properly secured and protected against breakage. Condensers are air-cooled, assuring trouble-free service with but a minimum of maintenance.

The rectifiers are claimed to hold the cabs at a cool 85° F and relative humidity of 30 to 50 per cent at ambient temperatures of 170° F without excessive head pressures or wear on the machine.

Aircraft Blueprints Get Wraps



PROTECTION for aircraft blueprints at Curtiss-Wright Corp.'s propeller division plant in Caldwell, N. J., is provided by encasing them in V.P.D. plastic sheets made by Joshua Meier Co. Inc., New York. Sheets are Lumarith acetate plastic and provide full visibility while guarding against grime and grease. Other much handled items like shop tickets, route sheets, cost sheets and lubrication charts are given the same protection

Planning an addition to present facilities?
Planning a brand new PLANT?

—You can use the skill and practical experience of

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to good advantage

Yes—look to this skilled, experienced organization for practical advice and aid, or let our engineers work with you while plans are still in the formative stage.

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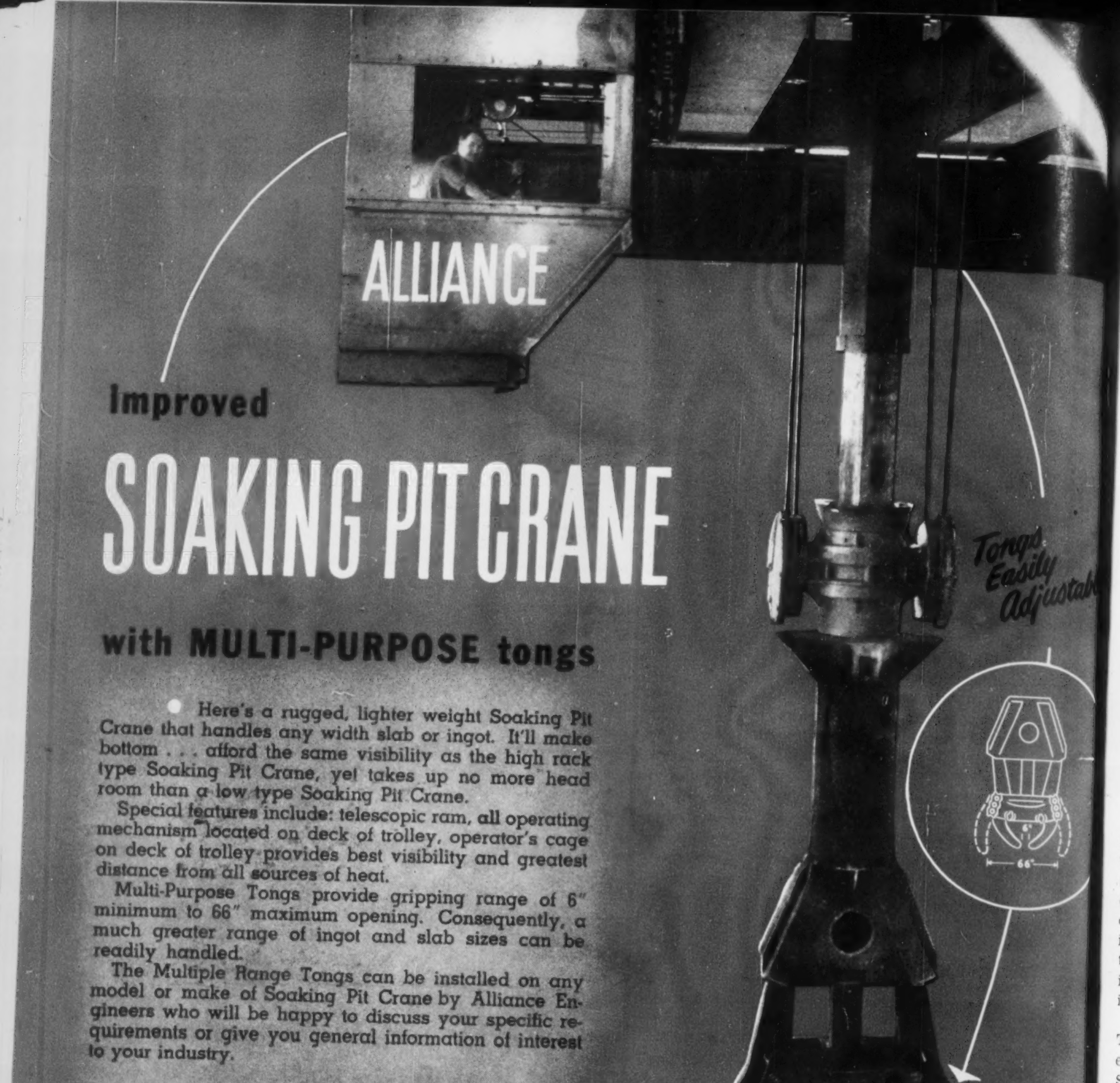

Improved

SOAKING PIT CRANE

with MULTI-PURPOSE tongs

● Here's a rugged, lighter weight Soaking Pit Crane that handles any width slab or ingot. It'll make bottom . . . afford the same visibility as the high rack type Soaking Pit Crane, yet takes up no more head room than a low type Soaking Pit Crane.

Special features include: telescopic ram, all operating mechanism located on deck of trolley, operator's cage on deck of trolley provides best visibility and greatest distance from all sources of heat.

Multi-Purpose Tongs provide gripping range of 6" minimum to 66" maximum opening. Consequently, a much greater range of ingot and slab sizes can be readily handled.

The Multiple Range Tongs can be installed on any model or make of Soaking Pit Crane by Alliance Engineers who will be happy to discuss your specific requirements or give you general information of interest to your industry.

- **MAXIMUM RANGE CAPABILITIES**
- **CRANE REQUIRES MINIMUM SPACE**
- **AFFORDS MAXIMUM VISIBILITY**
- **ALL MECHANISM EASILY ACCESSIBLE**
- **KEEPS OPERATOR AWAY FROM HEAT**

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New Products and Equipment

Hydraulic Power Units

Vickers Inc., 1480 Oakman Blvd., Detroit 32, Mich., announces the addition of a line of J.I.C. hydraulic power units constructed in accordance with recommended hydraulic standards for industrial equipment. Features include: Completely sealed tank, with breather air cleaner and separate filler hole having removable mesh screen and chain attached cap; elevated tank body with dished bottom, drain plug and cleanout holes at both ends to permit drainage without spillage and complete cleaning of the tank; and flush type oil level indicator with high and low oil positions marked. Motor mounting plate is separate from tank for convenience in mounting units.

Units are available in three series: T20, T30 and T60 and 10 models for electric motors from ¾ to 25 hp. Single, double and two pressure pumps are used for 1000 psi service, two stage pumps for 2000 psi service.

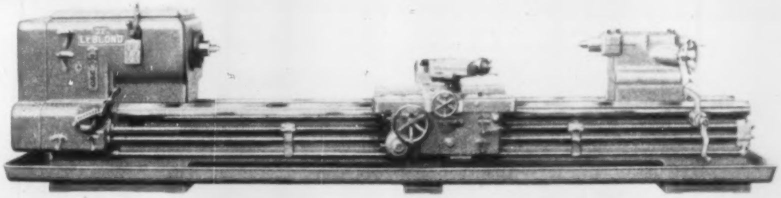
Check No. 1 on Reply Card for more Details

Rapid Lathe Traverse

Four directional power rapid traverse, standard equipment on the 32-inch heavy duty engine lathe made by R. K. LeBlond Machine Tool Co., Cincinnati 8, O. permits fast and convenient traversing of carriage and cross slide, each in two directions. It may be equipped for hydraulic (Hydra-Trace) or mechanical profiling. Other features include 34½-inch swing, 32 spindle speeds from 4 to 500 rpm, totally enclosed quick change box, hardened and ground replaceable steel bed ways and automatic lubrication throughout headstock, quick-change box and apron.

Headstock incorporates the free running principle with hardened and ground steel gears; only the gears actually needed are in mesh at a given speed, the remainder running free. No-load friction horsepower is thus minimized, leaving maximum power available for removing metal. The machine is arranged for 25, 30 or 40 hp motor, 1200 rpm. Forty-eight feeds and threads may be selected, feeds from 0.004 to 0.250-inch and threads from ¾ to 46.

Check No. 2 on Reply Card for more Details



Universal Grinder Improved

Improvements for the 10 x 24 inch type CH hydraulic universal grinder are announced by Landis Tool Co., Waynesboro, Pa. Machine is now equipped with the latest design swinging type internal grinding fixture which was previously available on the 12-inch grinder only. This fixture was developed for quick changeover from external to internal grinding operations. Housing on which the motor is mounted and in which the internal spindle is fitted is hinged to a casting mounted on the wheelbase. The internal fixture is driven by a 1 hp motor.

A hydraulic type, rapid wheel positioning mechanism is available on the grinder. This mechanism rapidly advances or retracts the wheelbase as needed. It is not a grinding feed. Where internal and external grinding are done in one setup it eliminates the need of turning the hand wheel in order to correctly position the grinding wheel. Action of this mechanism is controlled from a lever at the front of the machine. A safety interlock prevents it from being inadvertently operated during a normal grinding setup.

Check No. 3 on Reply Card for more Details

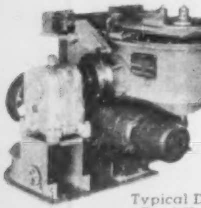
Continuous Sheet Record

A beta ray gage for continuously recording variations in weight per unit area or thickness of a wide variety of moving sheet materials directly on the production line is announced by Industrial Nucleonics Corp., 1205 Chesapeake Ave., Columbus, O. Steel, aluminum, brass and plastics are among the materials which can use the gage. Gage can measure accurately and continuously to a few millionths of an inch without contacting the material being gaged, is able to operate continuously without any standardization or recalibration by plant personnel, is insensitive to steel composition changes and has a high degree of stability under adverse plant conditions.

Material being measured is run through a gap between the source of radioactive material and detector preventing a portion of the source radiation from reaching the detector in proportion to the weight per unit area of the material. Readings directly in terms of thickness can be made on materials of constant density. Hermetically sealed beta radiation source

Federal

AUTOMATIC FEEDING DEVICES BOOST PRODUCTION AS MUCH AS 400%



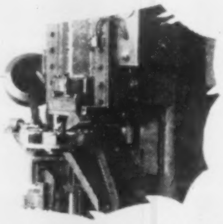
Typical Dial Feed Unit

If you are making long runs of welded parts, and are interested in increasing production and product quality, you should know about Federal Welder indexing tables, dial feeds, automatic feeding, loading and unloading devices.

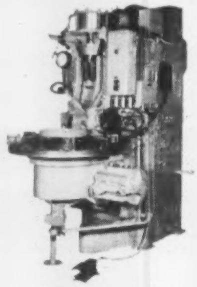
Ideal for large production runs, these Federal automatic devices pay for themselves in short order. Usually adaptable to a standard welder, they reduce the cost of the completed assembly by reducing the man hours required to perform the welding operation. It is not uncommon for an automatic feed to quadruple production over the hand fed method, and, in addition, save 50-70 percent of assembly time.

Federal automatic feeding devices lower production time by eliminating welder down time, and by eliminating fitting, clamping and other operator handling required by piece work methods.

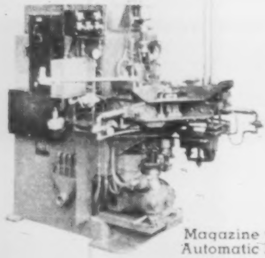
Federal automatic devices permit the welder to deliver welds of consistent high quality and uniformity. Once conditions are set they continue with every weld — eliminating the chance of human error.



Hopper, automatic feed, automatic ejection unit attached to welder



Dial Feed with automatic ejection



Magazine type Automatic Feed

Federal can furnish automatic equipment for almost any welding operation suitable for automatic feeding. For further data contact the Federal representative nearest you — or write and we will have him call on you at your convenience.

Federal® WELDERS

Warco PRESSES®

THE FEDERAL MACHINE & WELDER COMPANY

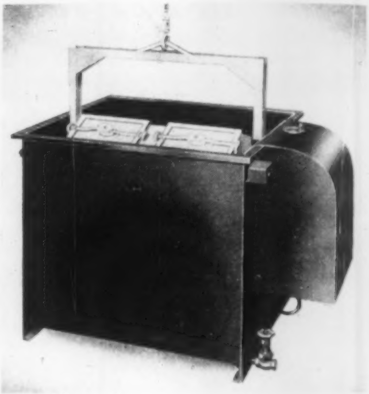
WARREN, OHIO

capsule is protected by a ¼ inch welded steel housing and is provided with an electrically operated shutter mechanism to assure complete safety for operation personnel. Floor mounted console is constructed of 14 gage steel and houses a Bristol Dynamaster electronic strip chart recorder, three regulated ac power suppliers, reference batteries and automatic standardizing control mechanism.

Check No. 4 on Reply Card for more Details

Submerged Parts Finishing

Submerged finishing machine made by Almco, division of Queen Stove Works Inc., Albert Lea, Minn., is useful in the processing of heavy parts and large soft metal parts. Cushioning effect which results from the complete immersion of the barrel lessens the impact between large parts to such an extent that nicking and scratching are kept to a minimum.



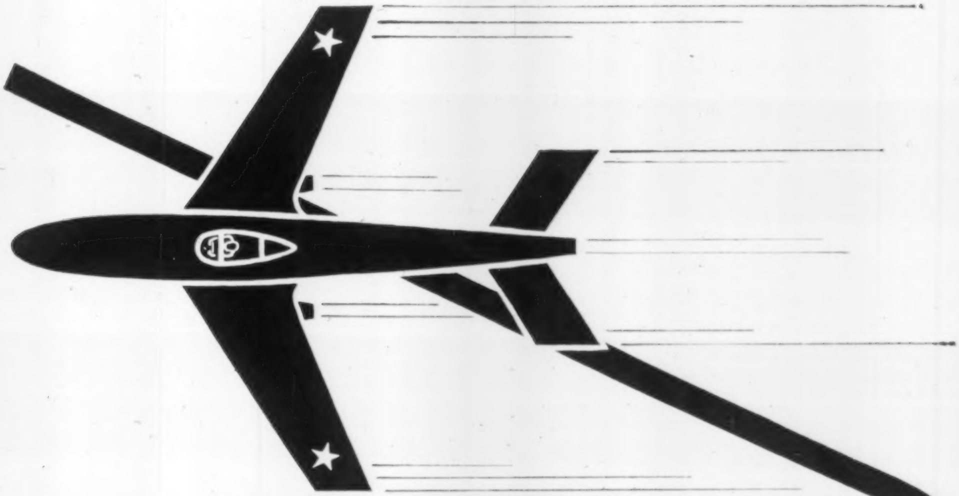
Another adaptation of this new submerged barrel is in the processing of smaller parts requiring the utmost in color and microinch finish. The perforated steel drum revolves in an open tank of liquid. It is loaded with work parts and the abrasive chips or metal shapes. Various liquid compounds are used in the tank depending on whether the operator is to burnish, polish, clean, descale or rustproof. Model may be used alone or in-line for multiple operation processing.

Check No. 5 on Reply Card for more Details

Air Operated Cleaner

A vacuum cleaner operating on high pressure compressed air is a development of Syntron Co., 370 Lexington Ave., Homer City, Pa. It is used for cleaning stockbins and dusty or linty machines or under explosive conditions where electric cleaners would present a hazard.

The cleaner is made of aluminum



TUF-STUF'S best proving ground is in the air!

It pays to specify *TUF-STUF* aluminum bronze alloys for parts that must stand up

● Because they are both light and tough, TUF-STUF aluminum bronze alloys have proven invaluable in America's aircraft as valve-seat inserts, spark plug inserts, valve guides, gears and other vital parts.

If your product requires machined parts that are strong but light, resistant to corrosion, long wearing and resistant to oxidation even at high temperatures, then TUF-STUF is the right alloy for the job.

TUF-STUF alloys are furnished in the form of forgings, rods and screw machine parts. They fill Federal Specification QQ-B-666, Grade B, and several other variations. Because of the increased use and demand for both aluminum and copper, jobs carrying a Defense Order Number are receiving first consideration.

MUELLER BRASS CO.

PORT HURON 19, MICHIGAN

61

and plastic stampings and the dirt collector bag is inside the cleaner for ease in emptying. It operates on air pressure of from 70 to 160 psi and consumes about 4½ cubic feet of air per minute at 100 psi. Unit comes complete with a 12-foot length of air hose ready for operation.

Check No. 6 on Reply Card for more Details

Cutting Oil Cooler

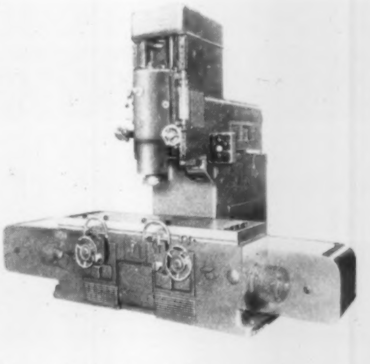
Cooling and control of lubricating or hydraulic oil to meet maximum production capacity and accuracy of machine tools is possible with Will-Cool oil cooler made by B. S. Williams Co. Inc., 6 North St., Mt. Vernon, N. Y. Oils are not exposed to the atmosphere while being cooled. Design permits inspection and cleaning of the inside and cooling surface without the necessity of disconnecting refrigerant lines or oil lines. Accumulation of fine metal particles is restricted to a noncooling surface where they can be seen and removed.

Unit will cool all machine tool oils within their range of viscosities so that different oils may be selected if desired without affecting the operation. Size ranges from 1½ to 7½ tons. A simple method of calculating refrigerant capacity required for machine tools has been developed so the cooler size will be large enough to control the temperatures in midsummer after the machine has been increased to maximum capacity.

Check No. 7 on Reply Card for more Details

Vertical Miller Improved

Improvements in its No. 4 vertical milling machine are announced by Reed-Prentice Corp., 677 Cambridge St., Worcester 4, Mass. This machine is now offered in both 48 and 60 inch capacities. The 60 inch model offers a working surface of 24 x 96 inches while the 48 inch model provides a 24 x 84-inch working surface. Designed for heavy-duty milling and die sinking operations, the miller features electronic control for all feeds through a master control station containing spindle start, stop and jog pushbuttons, dials for controlling speeds of table, cross slide and vertical slide, selector switch for the two slides, and emergency master stop pushbutton.



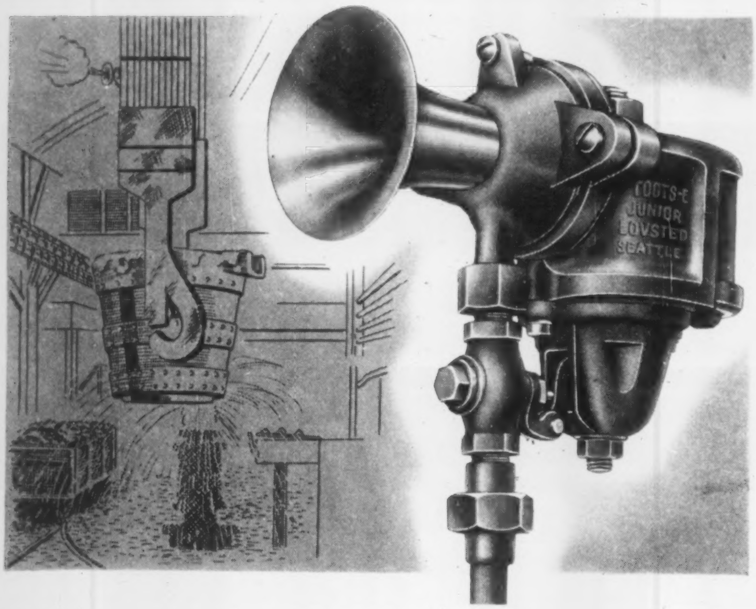
Two 3 hp ac motors, one for the table and one for the cross slide, power rapid traverse motion which has been increased in both the 48 inch and 60 inch models to 180 inches per minute. Spindle is reversible and is driven by a 10 hp 1200 rpm motor. Three 1½ hp motors drive the table, cross slide and vertical slide. Range of drives is from ½-inch to 25 inches per minute.

Check No. 8 on Reply Card for more Details

Brazing or Annealing Performed

A gas fired production heating machine introduced by Gas Appliance Service Inc., 1211 Webster Ave., Chicago 14, Ill., is suited for brazing plugs or adapters into ends of shell type units and annealing mouths of shell cartridges. Heating zone consists of two rows of high speed zigzag burners that bring sections to the proper temperature in a minimum time. Heat is confined to the work

FINGER-TIP CONTROLS



With a TOOTS-E Whistle

Finger-Tip Control to signal any man in your plant. Toots-E Jr. has a loud, distinctive tone which does not blend with any other noise in the plant. It is as snappy as a telegraph instrument, making it desirable for any type of coding.

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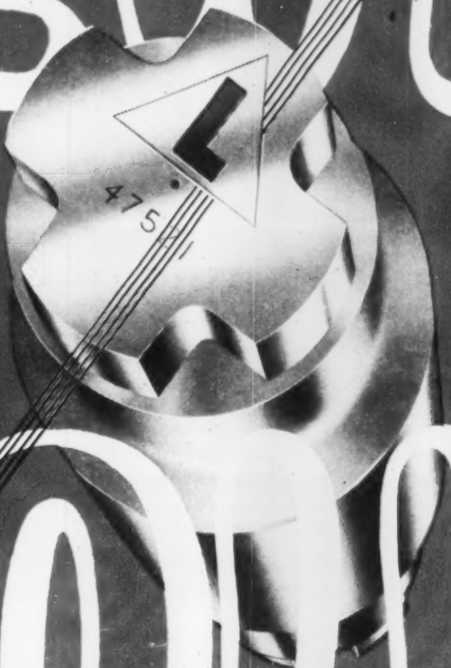

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FOR THE IRON, STEEL AND
NON-FERROUS
INDUSTRIES

LEWIS FOUNDRY AND MACHINE DIVISION OF BLAW-KNOX COMPANY • PITTSBURGH, PA.

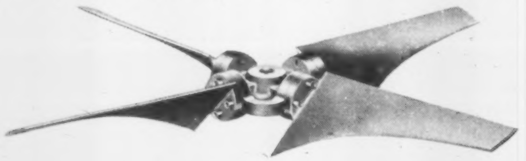
THIS NEW, HIGHER CAPACITY VENTILATOR SOLVES UNUSUAL AIR REMOVAL PROBLEMS

The highly efficient Burt Free Exhaust Fan Ventilator exhausts an unrestricted column of air vertically upward at high velocity. Full-opening dampers open automatically when its Burt Axial Flow Airfoil Fan is operating — close automatically for thorough weather-proofing when motor is shut down.

If you require rapid spot removal of air contaminated with smoke, fumes, dust and heat, the Burt F. E. F. Ventilator is the most efficient unit for you. It is one of the many types in Burt's complete line of ventilators. See Sweet's or write for Bulletin S. P. V. 18.

Equipped with

BURT AXIAL FLOW AIRFOIL FAN



Aerodynamically designed for the rapid removal of air. Center hub is cast solid, with blades attached separately to permit prestressing and elimination of blade breakage at hub juncture. Each fan is balanced and test run at factory.

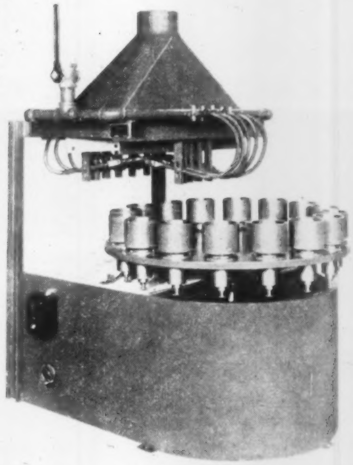
FAN & GRAVITY VENTILATORS • LOUVERS • SHEET METAL SPECIALTIES

The Burt Manufacturing Company

905 So. High St. Akron 11, Ohio

area and excessive heating of surrounding portions is eliminated. Cups which hold pieces are provided with spindles that rotate while passing through the heating zone.

Production of 600 pieces per hour is possible in a 60-inch diameter unit. Only one operator is required for loading and unloading pieces on the machine. Various types and sizes of turntables or conveyor units are available for accommodating a variety of diameters and production requirements.



Check No. 9 on Reply Card for more Details

Power Operated Table

A power operated pump increases the speed of operation where many cycles of elevating and lowering are required with a hydraulic elevating table. Lyon-Raymond Corp., 91-80 Madison St., Greene, N. Y., offers a ¾-hp motor-driven pumping unit for its line of hydraulic tables. Pump may be operated either by a foot pedal control switch or pushbutton hand switch. Unit has a self-contained oil reservoir and is supplied with either the conventional type or pancake type ball bearing motor with current characteristics to meet requirements.

Check No. 10 on Reply Card for more Details

High Speed Shaper

A high speed floor model shaping machine made by Newey Engineering Co., Nottingham, England, utilizing an 18-inch stroke, 35-inch ram and four speeds varying from 22 to 115 strokes per minute is available through British Industries Corp., International Machinery Division, 164 Duane St., New York 13, N. Y. Both base and body are heavily cast and are internally ribbed to insure maximum rigidity. Automatic horizontal

Short-cut to a fine preplating finish --

RESINIZED METALITE® CLOTH BELTS

Piece after piece of these auto grills goes through in jig time, with flash marks removed, all ready for the plating operation. The muscles in the arm of the operator show he's shoving the work hard against the belt, with complete assurance of freedom from scratches, wild grain marks, or undue heating. The resinized bond, in itself immune to heat, also prevents excess heat by holding the electro-coated abrasive grains up to their work so they cut — not rub — and generate a minimum of heat, most of which is dissipated in the long belt travel from the contact wheel to the idler pulley and back to the point of contact.

The right METALITE belts and contact wheel can put your finishing operations at a new high for speed and profit. Check with BEHR-MANNING Field Engineers — they'll recommend the right method and prove its excellence in a demonstration. Write us now.

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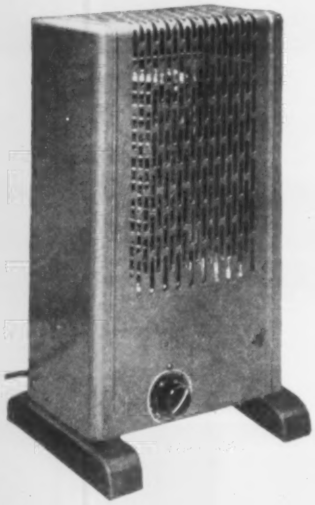

Why not use Perforated Metal?

This Wesix Electric Heater shows a typical application of Hendrick Perforated Metal, combining utility and attractiveness. The heater guard is 20 gauge steel, with 3/16" x 1½" side stagger perforations.

With facilities for producing any required shape and size of perforations in any commercially rolled metals, Hendrick invites inquiries from manufacturers who may be considering the use of perforated metal in connection with any of their products.

1876 — Seventy-Fifth Anniversary — 1951

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Wedge-Slot Screens
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Imitated . . . but never equaled

NON-FLUID OIL is identified by our *sprocket wheel trade mark* which appears on every shipment . . . large or small. NON-FLUID OIL has been widely imitated . . . but never equaled.

We cannot emphasize too strongly that NON-FLUID OIL is a specialty lubricant . . . sold only by "performance standards." NON-FLUID OIL is produced in grades exactly suited to the particular need of each type of industrial machinery . . . each grade having been "service tested" to prove its superiority over ordinary oils and greases.

Write for instructive bulletin and free testing sample of NON-FLUID OIL.

NEW YORK & NEW JERSEY LUBRICANT CO.
292 Madison Ave., New York 17, N. Y. Works: Newark, N. J.
WAREHOUSES: Atlanta, Ga. • Birmingham, Ala. • Charlotte, N. C. • Chicago, Ill. • Columbus, Ga. • Detroit, Mich. • Greensboro, N. C. • Greenville, S. C. • Providence, R. I. • St. Louis, Mo.

NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture.

feed motion is arranged to give four variations of feed per ram stroke. Drive is from a self-contained motor mounted on an adjustable stool and is transmitted by three V belts through a matrix multiple-disk friction clutch to a totally enclosed four-speed box.

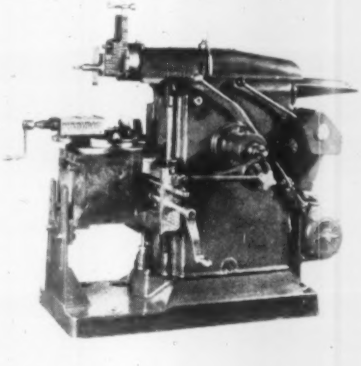
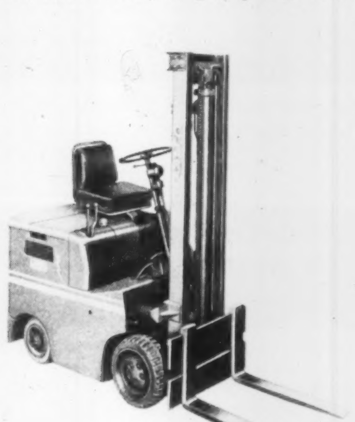


Table surface is 11 x 16½ inches, maximum ram to table is 16 inches, longitudinal traverse is 16 inches, and vertical traverse is 14 inches. Maximum down feed of tool head is 5 inches.

Check No. 11 on Reply Card for more Details

Faster Lift Truck

Features of the Clipper electric battery-powered fork-lift truck announced by Clark Equipment Co., Battle Creek, Mich., include increased speed, 2000-pound capacity at 24-inch load center, fingertip directional lever, automatic acceleration, pivot-mounted steering axle and cushion-style tires. Control lever is mounted on the steering column for selection of direction of travel and simultaneous engagement of first point-of-power. Automatic acceleration includes elimination of jerking and possibility of human error.



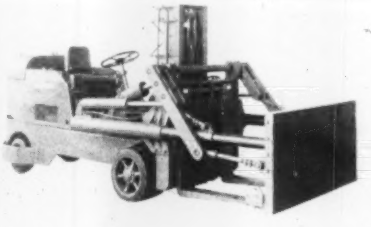
When the driver's seat is vacated

the control lever is locked in neutral and a parking brake on the motor drive shaft is set automatically. Truck can be moved only when the driver's seat is occupied, or depressed. Overall length of truck, less forks, is 63⅝ inches, width is 34½ inches. Truck's turning radius is 61½ inches. Overall height of standard uprights with forks down is 83 inches and overall height at 124-inch maximum lift is 142½ inches.

Check No. 12 on Reply Card for more Details

Die Handler

Handling heavy dies and transporting them to and from the die table of a press is simplified by the unloader accessory offered by the Towmotor Corp., 1226 E. 152nd St., Cleveland 10, O. Die is lifted and transported with the pusher plate retracted and is unloaded onto the die table by extending the plate to the position shown in the photo.

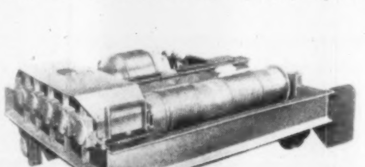


To pick the die from the table a chain is passed around the die and linked to the hooks at each side of the pusher plate. When the plate is retracted the die is pushed onto the lift fork. Development also is suitable for speedy handling and positioning heavy jigs and fixtures on various types of machines.

Check No. 13 on Reply Card for more Details

Light Electric Hoist

Conco Engineering Works, Dendota, Ill., announces a type SD trolley hoist available in 5 and 7½-ton capacities. Features of the hoist include: Completely electric welded steel trolley frame and hoist gear housing, all gears machine cut from solid steel blanks, fully enclosed and operating in oil, all shafting provided with heavy duty roller bearings.



Hoists are available with mechani-

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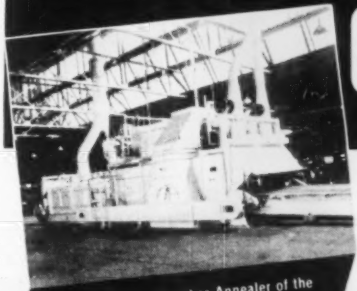
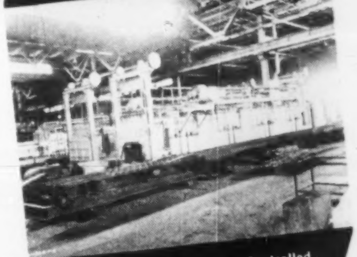
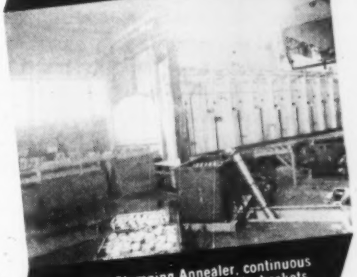


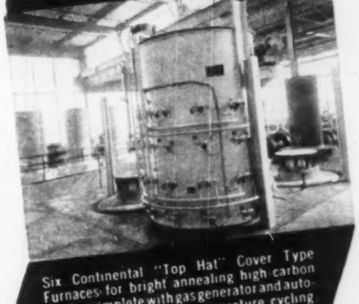
Continental Twin-Chamber Annealer of the recirculating type with automatic conveyor transfers and close-tolerance control for time-temperature cycle.



Two Continental Continuous Controlled Atmosphere Annealers, roller rail type, complete with transfer cars and conveyor systems.



Continental Stamping Annealer, continuous roller rail type, complete with baskets, handling conveyors, and automatic controls for work handling and temperature cycles.



Six Continental "Top Hat" Cover Type Furnaces for bright annealing high carbon steel complete with gas generator and automatic controlled time temperature cycling

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Whatever your heat process problems in plant conversion for military production, CONTINENTAL has the answer.

CONTINENTAL jobs begin with analysis of the requirements, then the selection and development of proper methods for greatest results. Finally follows the design, the building, and installation of the equipment including necessary work-handling accessories and control devices—delivering a COMPLETE UNITIZED PRODUCING PACKAGE with results guaranteed.

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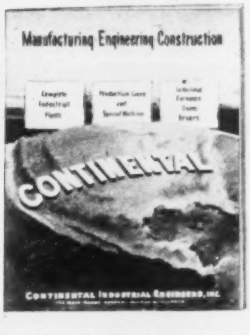
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PRODUCTION LINES
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SPECIAL MACHINES
COMPLETE PLANTS

MANUFACTURERS—ENGINEERS—CONTRACTORS FOR OVER A QUARTER OF A CENTURY

cal load brake of Weston screw and disk type or arranged for dynamic lowering with either alternating or direct current controls. It combines modern design with low headroom.

Check No. 14 on Reply Card for more Details

Shell and Projectile Handle

A specialized adaptation by Lamson Corp., Syracuse, N. Y., arranges conveyor rollers to form a wide V to cradle cases and projectiles for handling. The unit is made for quick shipment in standard 10-foot sections and 90-degree curves.

Projectiles can be taken off the conveyor by rolling over the conveyor guard rail, thus eliminating lifting operations. Rollers are easily snapped out and reversed should they become worn in one area. The conveyor section may also be used to convey nonmilitary cylindrical shaped products without alteration, or can be converted for handling of normal peacetime products.

Check No. 15 on Reply Card for more Details

Brush-Backed Sanding Wheel

Model 350R, an improved Sand-O-Flex sanding wheel, is offered by Merit Products Inc., Culver City, Calif. It is a brush backed sanding device that may be attached to any rotating shaft for sanding and finishing curved and contoured surfaces. Sander has eight replaceable brushes fastened to its perimeter.

Check No. 16 on Reply Card for more Details

Liquid Neoprene Coating

Atlas Mineral Products Co., Mertztown, Pa., has improved its liquid Neoprene coating so that it is readily sprayed and fast curing at ordinary temperatures. It is based on DuPont Neoprene. Known as Neobon, it is available both as a high solids spraying solution and a trowel cement.

Check No. 17 on Reply Card for more Details

Nonreleasing Type Tap Holder

No. 00 floating holder, introduced by Canfield Screw Machine Co., Stratford, Conn., is a nonreleasing type tap holder for use on hand screw machines and turret lathes. It is made of hardened steel and highly polished for long wear.

Check No. 18 on Reply Card for more Details

Controls Industrial Operations

The multi-cam recycling timer developed by Industrial Timer Corp., Newark, N. J., provides an easily operated method for controlling industrial manufacturing and processing operations. A group of cams, operating snap-action switches, is mounted on a single shaft driven by a synchronous motor. All cams rotate simultaneously and continuously repeat a constant time cycle common to all circuits. Each cam is independently adjustable for on and off electrical periods.

Check No. 19 on Reply Card for more Details

Larger Size Bushings

Holiner bushings, manufactured by Martin Engineering Co., Kewanee, Ill., are available in three outside dimensions with the following hole sizes: 5/16, ⅜, 7/16, ½, ⅝, ¾, ⅞ and 1 inch. They can be adjusted to meet an uneven or wedge shape core box.

Check No. 20 on Reply Card for more Details

Paint Resists Heat

Developed by Fire-Gard Inc., Washington 5, D. C., is a series of high temperature paints that is capable of withstanding temperatures up to 1900° F. It can be applied to all types of wood or metal surfaces and forms a bright finish that is also resistant to moisture, corrosion, mild acids, mild alkalies and oxidation or fumes encountered in industrial plants. Paints are available in aluminum and most colors.

Check No. 21 on Reply Card for more Details

Prevent Nozzle Plugging

To prevent the passage of small foreign particles that could block the orifices of descaling spray nozzles, C. B. Hunt & Son Inc., Salem, O., announces a high pressure hydraulic strainer. It prevents scale streaks and reduces product rejects. It is placed in the line ahead of the spray nozzles. It is available in 1½ to 6-inch sizes for line pressures to 1500 psi.

Check No. 22 on Reply Card for more Details

Socket Meter Troughs

Square D Co., Milwaukee 12, Wis., announces a new line of socket meter troughs. They are available for either indoor or outdoor installations, surface or flush mounting. Sockets are rated 100 amp and accommodate up to six jaws, easily converted to either horizontal or vertical positions.

Check No. 23 on Reply Card for more Details

Sectional Tables

Sectional tables for setting up special purpose machines or multiple spindle drill presses to fit the job are offered by Delta Power Tool Division, Rockwell Mfg. Co., Milwaukee 1, Wis. Each table section is 23⅜ inches wide and 30 inches long and with the addition of the end sections, is increased to 35 inches in length. Adequate drain trough for carrying off coolant on wet cutting operations is provided.

Check No. 24 on Reply Card for more Details

Two New Gages

Scully-Jones & Co., Chicago 8, Ill., offers the flush pin gage and the height gage. They are used for presetting drills, taps, reamers, counterbores, countersinks and other cutting tools which have been inserted in adjustable adapters before being placed in machine spindles.

Check No. 25 on Reply Card for more Details

Bends to 180 Degrees

Model No. 1200 hand tool, made by Tal Bender Inc., Milwoukee 2, Wis., makes perfect offsets and bends up to 180 degrees in ⅜, ½ and ⅝-inch OD K and L copper tubing, brass, Bundy weld, steel and other light gage tubing. The tool has no loose parts and no vises or fixtures are required for its use.

Check No. 26 on Reply Card for more Details

Magnetic Base Holder

No 150 duplex magnetic base indicator holder, introduced by Enco Mfg. Co., Chicago 39, Ill., attaches with a 100-pound pull to flat or curved surfaces for holding all dial indicators securely in place. Unit has a fingertip release for removal or positioning holder without jarring indicator that is being held. The set includes accessories for accommodating all stem type, hole type and lug back indicators.

Check No. 27 on Reply Card for more Details

Oilless Bearings, Bushings

Gopi graphited oilless bearings and bushings are offered by Bronze Bearing Inc., Cranford, N. J. They are for installation in remote and inaccessible locations, where fluid lubricants would contaminate work in process, high temperature would oxidize oil, oil films would rupture under heavy static loads, bearings are immersed in liquids, or where machines must be made as immune as possible to carelessness and neglect.

Check No. 28 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment
in this section, fill in a card.
It will receive prompt attention.

Helpful Literature

75. Water Scale Control

Aqua Electric Scale Control, Inc.—Control of scale formation in equipment using water is subject of 4-page illustrated bulletin 100 which describes Aqua electric scale control unit which is available in capacities up to 450 gpm.

76. Tractor Attachment

Lull Mfg. Co.—6-page illustrated folder suggests 18 questions to be asked before buying any industrial shovel attachment for tractors. Features of Lull Shoveloader and how it can be used for handling bulk materials with shovel, logs and railroad ties with forks, and as lifting crane, powered street and snow sweeper and bulldozer are covered.

77. Tube Bending Machine

Paul Machine Tool & Die Works—4-page illustrated bulletin details how model A automatic Bend-Ex air compression tubular bending machine achieves over 900 bends per hour on round, square and rectangular tubing as well as on pipe, light angles and solid bars. Machine permits as high as 10 bends on single 16 to 18-gage steel tube up to 1¼-in. OD.

78. Furnace & Oven Controls

Minneapolis - Honeywell Regulator Co., Brown Instruments Div.—28-page illustrated catalog No. 51-1 lists and prices variety of instruments such as temperature controllers, recorders and indicators; electric and pneumatic operated control valves; relays; control motors; and safety control equipment generally used in temperature control of ovens and furnaces.

79. Power Tools

Rockwell Mfg. Co., Power Tool Div.—12-page illustrated "Delta Power Tool Journal" is devoted to application of Delta-Milwaukee machine tools, Delta Crescent woodworking machines and Delta Multiplex radial arm saws. How these machines are used to produce wooden murals, aluminum window sash, trailers and other items is covered.

80. Aluminum Goods

Aluminum Goods Mfg. Co. — 52-page illustrated brochure "Present and Future" depicts wide range of products manufactured for military and civilian usage, reviews manufacturing facilities, explains technical services available and outlines objectives for future attainment in the production of aluminum goods and equipment.

81. Rotary Work Feed Table

Bellows Co. — 12-page illustrated bulletin T-80 describes in detail all parts of rotary work feed table. Dimensional drawings and specification data are shown, along with wiring diagrams and electrical hook-ups to combine table with other Bellows "packaged" pneumatic devices.

82. Cutter & Radius Grinders

Niles-Bement-Pond Co., Pratt & Whitney Div.—8-page illustrated circular No. S455-5 covers 4½-in. capacity R-6 and 10-in. capacity R-8 cutter and radius grinders. These machines are designed to grind straight or tapered flutes and to finish ends of cutters to accurate radii leaving cutter in condition to work cleanly and smoothly.

83. Refrigeration Panels

Bowser Technical Refrigeration Div. — Illustrated bulletin WR-251 gives detailed information relevant to prefabricated insulated refrigeration panels suitable for erection of hot or cold walk-in rooms.

84. Electronic Instruments

Industrial Electronics, Inc.—4-page illustrated bulletin A-101 deals with custom-built Head electronic instruments for specific applications such as problems dealing with torsional and linear vibrations, static and dynamic automotive and aircraft engine pressures, thickness measurements, recording and analysis of ultra high frequency transients, and micro-inch displacements, stresses and strains.

85. Drill Jig Bushings

American Drill Bushing Co.—Illustrated catalog covers types and sizes, handy technical information, drill sizes with their decimal equivalents and price lists of various types of drill jig bushings.

86. Safety Skin Creams

Boyer-Campbell Co.—16-page illustrated bulletin "Skin-Cote Fortifies the Future of Working Hands" describes six types of creams and four different liquids for protection of workmen's hands from industrial dermatitis. Recommended uses, characteristics and packaging of each type, together with application guidance, are tabulated on protective and cleaning materials.

87. Hardenable Resins

Ciba Co.—20-page illustrated bulletin "Araldite Ethoxyline Resins" details properties and uses of these resins which harden practically without evolution of water or volatile matter. They have high resistance to corrosion with adhesive properties towards metals, ceramics and other material. Bonding, casting and surface coating resins are covered.

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88. Machine Tools

Giddings & Lewis Machine Tool Co.—Five illustrated bulletins contain complete information and specifications on models 340-T, 350-T and 300-T horizontal boring, drilling and milling machines; Cincinnati Hypro vertical boring and turning mill; and machine attachments and accessories which extend working ranges of these machine tools. Details are presented on how these machines and accessories can be employed to solve difficult production problems.

89. Metal Stitching Machine

Bostitch—8-page illustrated bulletin "Metal Stitching" explains how metal stitching can be used to speed up production in fastening metals and other nonbrittle materials with steel wire staples. Typical applications and various types of machines are shown.

90. Precision Drill Press

Hamilton Tool Co.—Details of Super Sensitive drilling machine for production drilling of small holes are presented in 4-page illustrated bulletin AM-47. Drilling capacity is 0.004 to 0.250-in. in all drillable materials, and spindle speeds with various motors and drives are 788 to 9500 rpm.

91. Beam Scale Attachment

Howe Scale Co.—4-page illustrated folder form 668 presents features of Howe 77 Weightograph which is attached to any beam scale or to any scale convertible to beam operation. It makes scale "automatic". Weight is read in large illuminated graduations and figures.

92. Direct-Fired Heaters

Dravo Corp., Heating Dept.—8-page illustrated bulletin 526 is entitled "Dravo Counterflow Direct-Fired, Warm Air Heaters" and explains why these units have gained widespread industrial acceptance. Gas or oil fired models are available in outputs ranging from 400,000 to 2,000,000 Btu per hr. All units can be used as individual space heaters or for central systems with ducts if desired.

93. Die Casting Machine

A.B.C. Die Casting Machine Co.—4-page illustrated bulletin is check list of features of air-operated die casting machine for lead, tin and zinc alloys. Machine has capacity of 1 lb of zinc per shot including gates. Other features are automatic timing, calibrated temperature gas control, safety shot interlock and low die cost.

94. Foundry Refractories

Ironton Fire Brick Co.—4-page illustrated bulletin No. 101 "Refractories for the Modern Foundry" describes machine-made cupola blocks of Kentucky flint and semiflint clay in 4½, 6 and 9-in. sizes. Also described are ladle pouring brick and ladle bottom tile, both of which are listed in range of sizes to fit ladles up to 4000-lb capacity.

95. Blocks & Sheaves

American Hoist & Derrick Co.—24-page illustrated catalog No. 300-24 lists complete line of blocks and sheaves, block number, capacity in tons, number of sheaves rope size and weight, and weight of each block. Featured is section on "How to figure line parts".

96. Plastic Pipe

American Hard Rubber Co.—16-page illustrated bulletin presents engineering data on tubing, pipe, valves and fittings of Ace-Saran and Ace-Parian (polyethylene) plastics. Materials are light in weight, tough, durable, possess high impact strength and are resistant to most chemicals. Fabrication information is also presented.

97. Instrument Transformers

General Electric Co.—94-page illustrated brochure GEA-4626 "Instrument Transformer Buyer's Guide" supplies pertinent information on indoor and outdoor potential transformers, current transformers, metering outfits, potential and current portable transformers. Listings of ratio and phase-angle tests and tables covering mechanical and thermal limits of current transformers are included.

98. Bending Brakes

Dreis & Krump Mfg. Co.—12-page illustrated catalog P-51 describes line of Chicago steel power bending brakes and power universal box and pan brakes. Along with specifications on all standard machines, catalog gives details of improved motor drive, better clamping methods employed and accurate controls that simplify bending operations.

99. Pipe & Tube Properties

Babcock & Wilcox Tube Co.—104-page illustrated leather-bound pocket size technical bulletin 1B "Properties and Methods of Working Seamless and Welded Tubes and Pipe of B & W Stainless Croloys" is intended to serve engineers, designers and fabricators as guide in choosing proper material.

100. Miniature Speed Changers

Metron Instrument Co.—Illustrated technical data sheet No. 7 on zero backlash speed changers covers units which are intended for applications where backlash between high and low speed shafts must be zero or a very low value. Preloaded gearing is used in these miniature drive units.

FOR MORE INFORMATION USE ONE OF THESE CARDS . .

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The Market Outlook

MORE steel will pour into defense and defense-support consuming channels beginning July. Mill set-asides for rated tonnage and directives may exceed 50 per cent of total output that month. Set-asides for plates, tubes and alloy steels are likely to run still higher. Increased needs for new steel and aluminum producing facilities, along with heavier demands on direct defense account, are expected to force a still further boost in mill set-aside tonnages for August.

LEAD-TIME— Mill rolling schedules for July cannot be set up until government needs for the period are more fully known. Failure of DO and directive orders to come through by the May 15 deadline caused NPA to cut 15 days from lead-time on carbon products for July only. Consequently, the steel mills have until June 1 to learn what they will be expected to work into their July schedules.

SET-ASIDES— Substantial increases in mill set-asides for DO-rated work will be announced over the next few days. Tonnages for directive programs, such as freight cars, locomotives, ship work, etc., are expected to be distributed on a DO-rated basis. These were given ratings for June but continued to be served under allocations. They will require an increase in mill tonnage set-asides comparable to that allowed under allocation. Also, DO-ratings are extended to agricultural implements, machine tools, industrial furnaces, and additional equipment and accessories providing interim relief pending transition to Controlled Materials Plan distribution.

RATINGS— As DO-ratings are on a first-come-first-served basis, and as the mills have nothing for delivery before fourth quarter on some items, the questions arises whether the more extended deliveries will be adjusted upon announcement of increased set-asides, and at the expense of programs given DO-ratings for the first time. The answer appears to be "no." Future DO-rated promises were accepted by consumers and their schedules set up accordingly with deliveries of other products properly fitted in. To cut back on these promises now would mean confusion at both steel producing and consuming plants.

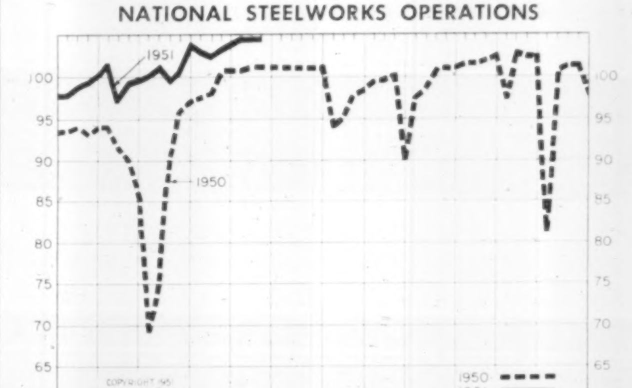
CMP DISTRIBUTION— Uncertainty is noted as maneuvering gets under way for transition to the Controlled Materials Plan July 1. This is especially noticeable as regards sheets, plates, bars, shapes and other products in tight supply. Expectations are transition to CMP may not be completed until fourth quarter. To assure orderly production and distribution under CMP, a production directive system is being set up in NPA to balance steel output against demand and issue production directives.

UNRATED TONNAGE— Just what tonnage will be available for unrated needs must remain unanswered until defense and supporting requirements in the months ahead are more fully known. With new DO orders flooding the mills, supply prospects for unrated consumers look anything but promising. Many rated orders are new and if much of this tonnage is to be worked into early third quarter, increases will have to be made in set-asides at expense of civilian goods account.

PRODUCTION— Steelmaking continues at record level. For the third successive week output held close to 2,078,000 tons. Major facility repairs are in the offing, however, foreshadowing some reduction in operations beginning this month. Last week the national ingot rate held at 104 per cent.

PRICES— Steel product and related prices are firm at levels frozen by the government in January. Some changes, however, are in the making. Last week several industry product advisory committees met with the Office of Price Stabilization and discussed proposed policies. Dollar-and-cents ceilings are under consideration for pig iron. A warehouse schedule, which will include provision for closely controlling gray market quotations, is reported about ready to be issued. Policy on bolts, nuts and rivets is being considered.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended May 19	Change	Same Week 1950	Same Week 1949
Pittsburgh	102	+ 1*	100.5	94
Chicago	107.5	− 1.5*	105.5	99
Mid-Atlantic	101.5	+ 0.5	98	92
Youngstown	105	− 1	107	105
Wheeling	98.5	0	106.5	86
Cleveland	100	− 1*	99.5	101
Buffalo	104	0	104	97.5
Birmingham	100	0	100	100
New England	91	− 7	84	66
Cincinnati	101	− 4	103	96
St. Louis	96.5	+ 10	87	75.5
Detroit	106	0	102	70
Western	104	0	95.5	92
Estimated national rate	104	0	101	95

Based on weekly steelmaking capacity of 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

* Change from revised rate for preceding week.

Composite Market Averages

	May 17, 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	171.92	171.92	171.92	156.13	111.62
Index in cents per lb.	4.657	4.657	4.657	4.230	3.024
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32	$106.32	$106.32	$93.23	63.54
No. 2 Fdry, Pig Iron, GT	52.54	52.54	52.54	46.47	26.17
Basic Pig Iron, GT	52.16	52.16	52.16	45.97	25.50
Malleable Pig Iron, GT	53.27	53.27	53.27	47.27	26.79
Steelmaking Scrap, GT	44.00	44.00	44.00	33.83	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	May 17 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.45	2.50
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.50
Bars, H.R., del. Philadelphia	4.20	4.20	4.20	3.93	2.82
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.10-15	3.10
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.40	2.35
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.35
Shapes, del. Philadelphia	3.91	3.91	3.91	3.46	2.465
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.50
Plates, Chicago	3.70	3.70	3.70	3.50	2.50
Plates, Coatesville, Pa.	4.15	4.15	4.15	3.60	2.50
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.50
Plates, Claymont, Del.	4.15	4.15	4.15	3.60	2.50
Sheets, H.R., Pittsburgh	3.60-75	3.60-75	3.60-75	3.35	2.425
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.425
Sheets, C.R., Pittsburgh	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.375
Sheets, Galv., Pittsburgh	4.80	4.80	4.80	4.40	4.05
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.25	2.35
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.35
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.15	3.05
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	3.15
Strip, C.R., Detroit	4.35-5.60	4.35-5.60	4.35-5.60	4.35-40	3.15
Wire, Basic, Pittsburgh	4.85-5.10	4.85-5.10	4.85-5.10	4.50	3.05
Nails, Wire, Pittsburgh	5.90-6.20	5.90-6.20	5.90-2.20	5.30	3.25
Tin plate, box, Pittsburgh	$8.70	$8.70	$8.70	$7.50	$5.25

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$63.00	$47.00
Wire rods, $\frac{7}{32}$-⅜", Pitts.	4.10-30	4.10-30	4.10-30	3.85	2.30

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$47.00	$27.00
Basic Valley	52.00	52.00	52.00	46.00	26.00
Basic, del. Phila.	56.49	56.49	56.49	49.44	27.84
No. 2 Fdry, Pitts.	52.50	52.50	52.50	46.50	26.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	46.50	26.50
No. 2 Fdry, Valley	52.50	52.50	52.50	46.50	26.50
No. 2 Fdry, Del. Phila.	56.99	56.99	56.99	49.94	28.34
No. 2 Fdry, Birm.	48.88	48.88	48.88	42.38	22.88
No. 2 Fdry (Birm.) del. Cin.	55.33	55.33	55.33	49.08	26.94
Malleable Valley	52.50	52.50	52.50	46.50	26.50
Malleable, Chicago	52.50	52.50	52.50	46.50	26.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	60.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts.	$45.00	$45.00	$45.00	$38.00	$20.00
No. 1 Heavy Melt, E. Pa.	43.50	43.50	43.50	29.00	18.75
No. 1 Heavy Melt, Chicago	43.50	43.50	43.50	34.50	18.75
No. 1 Heavy Melt, Valley	45.00	45.00	45.00	37.75	20.00
No. 1 Heavy Melt, Cleve.	44.00	44.00	44.00	34.25	19.50
No. 1 Heavy Melt, Buffalo	44.00	44.00	44.00	31.75	19.25
Rails, Rerolling, Chicago	52.50	52.50	52.50	48.50	22.25
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	42.50	20.00

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn., Connlsvl.	$14.75	$14.75	$14.75	$14.25	$7.50
Beehive, Fdry., Connlsvl.	17.50	17.50	17.50	16.00	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	21.00	13.00

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	20.50	12.00
Zinc, E. St. Louis	17.50	17.50	17.50	12.00	8.25
Lead, St. Louis	16.80	16.80	16.80	11.80	6.35
Tin, New York	139.00	139.00	142.00	77.50	52.00
Aluminum, del.	19.00	19.00	19.00	17.00	15.00
Antimony, Laredo, Tex.	42.00	42.00	42.00	24.50	14.50
Nickel, refinery, duty paid	50.50	50.50	50.50	40.00	35.00

Pig Iron

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	58.69	59.46	....
Newark, del.	56.74	57.24	57.74	58.24
Philadelphia, del.	56.49	56.99	57.49	57.99
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.33	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	61.63	62.18	62.63	....
Rochester, N.Y., del.	54.74	55.24	55.74	....
Syracuse, N.Y., del.	55.72	56.22	56.72	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	53.97	54.47	54.47	54.97
Muskegon, Mich., del.	....	58.20	58.20	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, del. from Cleve.	54.49	54.99	54.99	55.49
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	51.75	52.25	....
Fontana, Calif. K1	58.00	58.50	....	....
Geneva, Utah G1	52.00	52.50	....	....
Seattle, Tacoma, Wash., del.	....	60.35	....	....
Portland, Oreg., del.	....	60.35	....	....
Los Angeles, San Francisco, del.	59.85	60.35	....	....
Granite City, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
Lone Star, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.74	53.74	54.24
McKees Rocks, del.	....	53.49	53.49	53.99
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.00	54.00	54.50
Verona, del.	....	54.48	54.48	54.98
Brackenridge, del.	....	54.72	54.72	55.22
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.21	57.71	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.43	56.93	56.93	57.43

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SIVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

Niagara Falls, N.Y. P15	$83.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 x 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.12
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

All prices quoted under GCPR as reported to STEEL, May 17, 1951; cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicat e producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)

Fontana,Calif. K1	$79.00
Munhall,Pa. U5	52.00

INGOTS, Alloy (NT)

Detroit R7	$54.00
Fontana,Calif. K1	80.00
Houston,Tex. S5	62.00
Midland,Pa. C18	54.00
Munhall,Pa. U5	54.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Bessemer,Pa. U5	$56.00
Clairton,Pa. U5	56.00
Ensley,Ala. T2	56.00
Fairfield,Ala. T2	56.00
Fontana,Calif. K1	75.00
Gary,Ind. U5	56.00
Johnstown,Pa. B2	56.00
Lackawanna,N.Y. B2	56.00
Munhall,Pa. U5	56.00
So.Chicago,Ill. U5	56.00
So. Duquesne,Pa. U5	56.00

Carbon, Forging (NT)

Bessemer,Pa. U5	$66.00
Buffalo R2	66.00
Canton,O. R2	66.00
Clairton,Pa. U5	66.00
Cleveland R2	66.00
Conshohocken,Pa. A3	73.00
Detroit R7	69.00
Ensley,Ala. T2	66.00
Fairfield,Ala. T2	66.00
Fontana,Calif. K1	85.00
Gary,Ind. U5	66.00
Geneva,Utah G1	66.00
Houston,Tex. S5	74.00
Johnstown,Pa. B2	66.00
Lackawanna,N.Y. B2	66.00
LosAngeles B3	85.00
Munhall,Pa. U5	66.00
Seattle B3	85.00
So.ChicagoR2,U5,W14	66.00
So.Duquesne,Pa. U5	66.00
So.SanFrancisco B3	85.00

Alloy, Forging (NT)

Bethlehem,Pa. B2	$70.00
Buffalo R2	70.00
Canton,O. R2	70.00
Canton,O. (29) T7	66.00
Conshohocken,Pa. A3	77.00
Detroit R7	73.00
Fontana,Calif. K1	89.00
Gary,Ind. U5	70.00
Houston,Tex. S5	78.00
Ind.Harbor,Ind. Y1	70.00
Johnstown,Pa. B2	70.00
Lackawanna,N.Y. B2	70.00
Los Angeles B3	90.00
Massillon,O. R2	70.00
Midland,Pa. C18	70.00
Munhall,Pa. U5	70.00
So.Chicago R2,U5,W14	70.00
So.Duquesne,Pa. U5	70.00
Struthers,O. Y1	70.00
Warren,O. C17	70.00

ROUNDS, SEAMLESS TUBE (NT)

Canton,O. R2	$82.00
Cleveland R2	82.00
Fontana,Calif. K1	103.00
Gary,Ind. U5	82.00
Massillon,O. R2	82.00
So.Chicago,Ill. R2	82.00
So.Duquesne,Pa. U5	82.00

SHEET BARS (NT)

Fontana,Calif. K1	$89.00

SKELP

Aliquippa,Pa. J5	3.45
Munhall,Pa. U5	3.35
Warren,O. R2	3.35
Youngstown R2, U5	3.35

WIRE RODS

AlabamaCity,Ala. R2	4.10
Buffalo W12	4.10
Cleveland A7	4.10
Donora,Pa. A7	4.10
Fairfield,Ala. T2	4.10
Fontana,Calif. K1	4.90
Houston,Tex. S5	4.50
Johnstown,Pa. B2	4.10
Joliet,Ill. A7	4.10
Los Angeles B3	4.90
Minnequa,Colo. C10	4.35
Monessen,Pa. P7	4.30
No.Tonawanda,N.Y.B11	4.10
Pittsburg,Calif. C11	4.75
Portsmouth,O. P12	4.30
Roebling,N.J. R5	4.20
So.Chicago,Ill. R2	4.10
SparrowsPoint,Md. B2	4.20
Sterling,Ill(1) N15	4.10
Struthers,O. Y1	4.10
Torrance,Calif. C11	4.90
Worcester A7	4.40

PLATES, Wrought Iron

Economy,Pa. B14	8.60

STRUCTURALS

Carbon Steel Stand. Shapes

AlabamaCity,Ala. R2	3.60
Aliquippa,Pa. J5	3.65
Bessemer,Ala. T2	3.65
Bethlehem,Pa. B2	3.70
Clairton,Pa. U5	3.65
Fairfield,Ala. T2	3.65
Fontana,Calif. K1	4.25
Gary,Ind. U5	3.65
Geneva,Utah G1	3.65
Houston,Tex. S5	4.05
Ind.Harbor,Ind. I-2	3.65
Johnstown,Pa. B2	3.70
KansasCity,Mo. S5	4.25
Lackawanna,N.Y. B2	3.70
LosAngeles B3	4.25
Minnequa,Colo. C10	4.10
Munhall,Pa. U5	3.65
Niles,Calif.(22) P1	4.85
Phoenixville,Pa. P4	4.95
Portland,Oreg. O4	4.50
Seattle B3	4.30
So.Chicago,Ill. U5, W14	3.65
So.SanFrancisco B3	4.20
Torrance,Calif. C11	4.25
Weirton,W.Va. W6	3.90

Alloy Stand. Shapes

Clairton,Pa. U5	4.35
Fontana,Calif. K1	5.55
Munhall,Pa. U5	4.35
So.Chicago,Ill. U5	4.35

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5	5.50
Bessemer,Ala. T2	5.50
Bethlehem,Pa.(14) B2	5.50
Clairton,Pa. U5	5.50
Fairfield,Ala. T2	5.50
Fontana,Calif. K1	6.10
Gary,Ind. U5	5.50
Geneva,Utah G1	5.50
Ind.Harbor,Ind. I-2	5.50
Ind.Harbor,Ind. Y1	6.00
Johnstown,Pa. B2	5.50
Lackawanna,N.Y.(14)B2	5.50
LosAngeles B3	6.05
Munhall,Pa. U5	5.50
Seattle B3	6.10
So.Chicago, Ill. U5	5.50
So.SanFrancisco B3	6.00
Struthers,O. Y1	6.00

Wide Flange

Bethlehem,Pa. B2	3.70
Clairton,Pa. U5	3.65
Fontana,Calif. K1	4.65
Lackawanna,N.Y. B2	3.70
Munhall,Pa. U5	3.65
So.Chicago,Ill. U5	3.65

H.S., L.A. Wide Flange

Bethlehem,Pa. B2	5.50
Lackawanna,N.Y. B2	5.50
Munhall,Pa. U5	5.45
So.Chicago,Ill. U5	5.45

SHEET STEEL PILING

Ind.Harbor,Ind. I-2	4.45
Lackawanna,N.Y. B2	4.45
Munhall,Pa. U5	4.45
So.Chicago,Ill. U5	4.45

BEARING PILES

Munhall,Pa. U5	3.65
So.Chicago,Ill. U5	3.65

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5	5.65
Bessemer,Ala. T2	5.65
Clairton,Pa. U5	5.65
Cleveland J5, R2	5.65
Conshohocken,Pa. A3	5.90
Fairfield,Ala. T2	5.65
Fontana,Calif.(30) K1	6.25
Gary,Ind. U5	5.65
Geneva,Utah G1	5.65
Ind.Harbor,Ind. I-2	5.65
Ind.Harbor,Ind. Y1	6.15
Johnstown,Pa. B2	5.65
Munhall,Pa. U5	5.65
Pittsburgh J5	5.65
Seattle B3	6.55
Sharon,Pa. S3	5.70
So.Chicago,Ill. U5	5.65
SparrowsPoint,Md. B2	5.65
Warren,O. R2	5.65
Youngstown Y1	6.15

PLATES, Open-Hearth Alloy

Claymont,Del. C22	4.85
Coatesville,Pa. L7	5.25
Conshohocken,Pa. A3	5.05
Fontana,Calif. K1	5.70
Gary, Ind. U5	4.75
Johnstown,Pa. B2	4.75
Munhall,Pa. U5	4.75
Sharon,Pa. S3	5.20
So.Chicago,Ill. U5	4.75
SparrowsPoint,Md. B2	4.75

FLOOR PLATES

Cleveland J5	4.75
Conshohocken,Pa. A3	4.75
Harrisburg,Pa. C5	5.95
Ind.Harbor,Ind. I-2	4.75
Munhall,Pa. U5	4.75
So.Chicago,Ill. U5	4.75

PLATES, Carbon Steel

AlabamaCity,Ala. R2	3.70
Aliquippa,Pa. J5	3.70
Ashland,Ky(15) A10	3.70
Bessemer,Ala. T2	3.70
Clairton,Pa. U5	3.70
Claymont,Del. C22	4.15
Cleveland J5, R2	3.70
Coatesville,Pa. L7	4.15
Conshohocken,Pa. A3	4.15
Fairfield,Ala. T2	3.70
Fontana,Calif.(30) K1	4.30
Gary,Ind. U5	3.70
GraniteCity,Ill. G4	4.40
Geneva,Utah G1	3.70
Harrisburg,Pa. C5	4.95
Houston,Tex. S5	4.10
Ind.Harbor,Ind. I-2, Y1	3.70
Johnstown,Pa. B2	3.70
Lackawanna,N.Y. B2	3.70
Minnequa,Colo. C10	4.50
Munhall,Pa. U5	3.70
Pittsburgh J5	3.70
Seattle B3	4.60
Sharon,Pa. S3	3.95
So.Chicago,Ill. U5, W14	3.70
SparrowsPoint,Md. B2	3.70
Steubenville,O. W10	3.70
Warren,O. R2	3.70
Weirton,W.Va. W6	4.00
Youngstown R2, U5, Y1	3.70

PLATES, Carbon A. R.

Fontana,Calif. K1	5.45
Geneva,Utah G1	4.85

PLATES, Ingot Iron

Ashland,c.l.(15) A10	3.95
Ashland,lcl(15) A10	4.45
Cleveland,c.l. R2	4.30
Warren,O. c.l. R2	4.30

BARS, Hot-Rolled Carbon

AlabamaCity,Ala. R2	3.70
Aliquippa,Pa. J5	3.70
Alton,Ill.(1) L1	3.95
Atlanta,Ga. A11	4.25
Bessemer,Ala. T2	3.70
Buffalo R2	3.70
Canton,O. R2	3.70
Clairton,Pa. U5	3.70
Cleveland R2	3.70
Detroit R7	3.85
Emeryville,Calif. J7	4.45
Fairfield,Ala. T2	3.70
Fontana,Calif. K1	4.40
Gary,Ind. U5	3.70
Houston,Tex. S5	4.10
Ind.Harbor,Ind. I-2, Y1	3.70
Johnstown,Pa. B2	3.70
KansasCity,Mo. S5	4.30
Lackawanna,N.Y. B2	3.70
LosAngeles B3	4.40
Milton,Pa. B6	4.20
Minnequa,Colo. C10	4.15
Niles,Calif. P1	5.05
N.Tonawanda,N.Y. B11	3.70
Pittsburg,Calif. C11	4.40
Pittsburgh J5	3.70
Portland,Oreg. O4	4.65
Seattle B3, N14	4.45
So.Chicago R2, U5, W14	3.70
So.Duquesne,Pa. U5	3.70
So.SanFran.,Cal. B3	4.45
Struthers,O. Y1	3.70
Torrance,Calif. C11	4.40
Weirton,W. Va. W6	3.85
Youngstown R2, U5	3.70

BAR SIZE ANGLES; S. SHAPES

Aliquippa,Pa. J5	3.70
Atlanta A11	4.25
Johnstown,Pa. B2	3.70
Lackawanna,N.Y. B2	3.70
Niles,Calif. P1	5.05
Portland,Oreg. O4	4.65
SanFrancisco S7	4.85

BAR SIZE ANGLES; H.R. CARBON

Bethlehem,Pa. B2	3.90

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2	4.30
Buffalo R2	4.30
Canton,O. R2	4.30
Canton,O.(29) T7	3.95
Clairton,Pa. U5	4.30
Detroit R7	4.45
Ecorse,Mich. G5	4.65
Fontana,Calif. K1	5.35
Gary,Ind. U5	4.30
Houston,Tex. S5	4.70
Ind.Harbor,Ind. I-2, Y1	4.30
Johnstown,Pa. B2	4.30
KansasCity,Mo. S5	4.90
Lackawanna,N.Y. B2	4.30
LosAngeles B3	5.35
Massillon,O. R2	4.30
Midland,Pa. C18	4.30
So.Chicago R2, U5, W14	4.30
So.Duquesne,Pa. U5	4.30
Struthers,O. Y1	4.30
Warren,O. C17	4.30
Youngstown U5	4.30

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5	4.55
Gary,Ind. U5	4.55
Youngstown U5	4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy

Aliquippa,Pa. J5	5.55
Bessemer,Ala. T2	5.55
Bethlehem,Pa. B2	5.55
Clairton,Pa. U5	5.55
Cleveland R2	5.55
Fairfield,Ala. T2	5.55
Fontana,Calif. K1	6.60
Gary,Ind. U5	5.55
Ind.Harbor,Ind. I-2	5.55
IndianaHarbor,Ind. Y1	6.05
Johnstown,Pa. B2	5.55
Lackawanna,N.Y. B2	5.55
LosAngeles B3	6.25
Pittsburgh J5	5.55
Seattle B3	6.30
So.Duquesne,Pa. U5	5.55
So.SanFrancisco B3	6.30
Struthers,O. Y1	6.05
Youngstown U5	5.55

BARS, Cold-Finished Carbon

Ambridge,Pa. W18	4.55
BeaverFalls,Pa.M12,R2	4.55
Buffalo B5	4.60
Camden,N.J. P13	5.00
Carnegie,Pa. C12	4.55
Chicago W18	4.55
Cleveland A7, C20	4.55
Detroit P17	4.70
Donora,Pa. A7	4.55
Elyria,O. W8	4.55
FranklinPark,Ill. N5	4.55
Gary,Ind. R2	4.55
GreenBay,Wis. F7	4.55
Hammond,Ind. L2, M13	4.55
Hartford,Conn. R2	5.10
Harvey,Ill. B5	4.55
LosAngeles R2	6.00
Mansfield,Mass. B5	5.10
Massillon,O. R2, R8	4.55
Monaca,Pa. S17	4.55
Newark,N.J. W18	5.00
Plymouth,Mich. P5	4.80
Pittsburgh J5	4.55
Putnam,Conn. W18	5.10
Readville,Mass. C14	5.10
St.Louis,Mo. M5	4.95
So.Chicago,Ill. W14	4.55
SpringCity,Pa.(5) K3	5.00
Struthers,O. Y1	4.55
Waukegan,Ill. A7	4.55
Youngstown F3, Y1	4.55

BARS, Cold-Finished Alloy

Ambridge,Pa. W18	5.40
BeaverFalls,Pa. M12	5.40
Bethlehem,Pa. B2	5.40
Buffalo B5	5.40
Camden,N.J. P13	5.80
Canton,O. R2	5.40
Canton,O.(29) T7	4.90
Carnegie,Pa. C12	5.40
Chicago W18	5.40
Cleveland A7	5.45
Cleveland C20	5.40
Detroit P17	5.55
Donora,Pa. A7	5.45
Elyria,O. W8	5.40
Gary,Ind. R2	5.40
Hammond,Ind. L2, M13	5.40
Hartford,Conn. R2	5.85
Harvey,Ill. B5	5.40
Lackawana,N.Y. B2	5.40
Mansfield,Mass. B5	5.85
Massillon,O. R2, R8	5.40
Midland,Pa. C18	5.40
Monaca,Pa. S17	5.40
Newark,N.J. W18	5.75
Plymouth,Mich. P5	5.60
So.Chicago,Ill. R2, W14	5.40
Struthers,O. Y1	5.40
Warren,O. C17	5.40
Waukegan,Ill. A7	5.45
Worcester,Mass. A7	5.75
Youngstown F3, Y1	5.40

RAIL STEEL BARS

ChicagoHts.(3,4)I-2, C2	4.75
Franklin,Pa. (3, 4) F5	4.75
FortWorth,Tex.(26) T4	4.85
Huntngtn,W.Va.(3) W7	5.50
Marion,O.(3) P11	4.75
Moline,Ill.(3) R2	3.80
Tonawanda (3,4) B12	4.75
Williamsport(3) S19	5.00
Williamsport(4) S19	5.10

BARS, Wrought Iron

Dover,N.J.(Staybolt)U1	15.00
Dover,(Eng.Bolt) U1	13.50
Dover(Wrgt.Iron) U1	12.25
Economy,Pa. (S.R.) B14	9.60
Economy,Pa.(D.R.)B14	11.90
Economy,(Staybolt)B14	12.20
McK.Rks.(Staybolt) L5	14.50
McK.Rks.(S.R.) L5	9.60
McK.Rks.(D.R.) L5	13.00

BARS, Reinforcing (Fabricators)

AlabamaCity,Ala. R2	3.70
Alton,Ill.(6) L1	3.70
Atlanta A11	4.25
Buffalo R2	3.70
Cleveland R2	3.70
Emeryville,Calif. J7	4.45
Fairfield,Ala. T2	3.70
Fontana,Calif. K1	4.40
Gary,Ind. U5	3.70
Houston,Tex. S5	4.10
Ind.Harbor, Ind. I-2, Y1	3.70
Johnstown,Pa. B2	3.70
KansasCity,Mo. S5	4.30
Lackawanna,N.Y. B2	3.70
LosAngeles B3	4.40
Milton,Pa. B6	4.20
Minnequa,Colo. C10	4.50
Niles,Calif. P1	5.05
Pittsburg,Calif. C11	4.40
Pittsburgh J5	3.70
Portland,Oreg. O4	4.65
SandSprings,Okla. S5	4.60
Seattle B3, N14	4.45
So.Chicago,Ill. R2	3.70
So.Duquesne,Pa. U5	3.70
So.SanFrancisco B3	4.45
SparrowsPoint,Md. B2	3.70
Struthers,O. Y1	3.70
Torrance,Calif. C11	4.40
Youngstown R2, U5	3.70

BARS, Reinforcing

(Fabricated; to Consumers)

Huntington,W.Va. W7	5.50
Johnstown, ¼-1" B2	4.75
LosAngeles B3	5.45
Marion,O. P11	5.00
Seattle B3, N14	5.55
So.SanFrancisco B3	5.45
SparrowsPt. ¼-1" B2	4.75
Williamsport,Pa. S19	5.10

SHEETS, Hot-Rolled Steel

(18 gage and heavier)

AlabamaCity,Ala. R2	3.60
Ashland,Ky.(8) A10	3.60
Butler,Pa. A10	3.60
Cleveland J5, R2	3.60
Conshohocken,Pa. A3	4.00
Detroit M1	4.40
Ecorse,Mich.(8) G5	3.80
Fairfield,Ala. T2	3.60
Fontana,Calif. K1	4.55
Gary,Ind. U5	3.60
Geneva,Utah G1	3.70
GraniteCity,Ill. G4	4.30
Ind.Harbor,Ind. I-2,Y-1	3.60
Irvin,Pa. U5	3.60
Lackawanna,N.Y. B2	3.60
Munhall,Pa. U5	3.60
Niles,O. N12	5.25
Pittsburg,Calif. C11	4.30
Pittsburgh J5	3.60
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.60
SparrowsPoint,Md. B2	3.60
Steubenville,O. W10	3.60
Torrance,Calif. C11	4.30
Warren,O. R2	3.60
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.60

SHEETS, H.R., (19 gage)

AlabamaCity,Ala. R2	4.75
Dover,O. R1	5.65
Ind.Harbor,Ind. I-2	5.40
Mansfield,O. E6	5.65
Niles,O. N12	5.75
Torrance,Calif. C11	5.40

SHEETS, H.R. (14-ga., heavier) High-Strength Low-Alloy

Cleveland J5, R2	5.40
Conshohocken,Pa. A3	5.65
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.40
Fontana,Calif. K1	6.35
Gary,Ind. U5	5.40
Ind.Harbor,Ind. I-2	5.40
IndianaHarbor,Ind. Y1	5.90
Irvin,Pa. U5	5.40
Lackawanna(35) B2	5.40
Pittsburgh J5	5.40
Sharon,Pa. S3	5.40
So.Chicago,Ill. U5	5.40
SparrowsPoint(36) B2	5.40
Warren,O. R2	5.40
Weirton,W.Va. W6	5.75
Youngstown U5	5.40
Youngstown Y1	5.90

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2	6.55
Ecorse,Mich. G5	7.10
Fontana,Calif. K1	7.50
Gary,Ind. U5	6.55
IndianaHarbor,Ind. Y1	7.05
IndianaHarbor,Ind. I-2,	6.55
Irvin,Pa. U5	6.55
Lackawanna(37) B2	6.55
Pittsburgh J5	6.55
SparrowsPoint(38) B2	6.55
Warren,O. R2	6.55
Weirton,W.Va. W6	6.90
Youngstown Y1	7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana, Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 Ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23)F4	6.85

ROOFING SHORT TERNES (8 lb. coated)

Gary,Ind. U5	9.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland A10	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary, U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo C16	6.25	...
MartinsFy.O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.Md. B2	8.55	8.80
Warren R2	8.45	8.70
Weirton W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

BLACK PLATE (Base Box)

Aliquippa J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville, O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

STRIP, Hot-Rolled Alloy

Bridgprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S8	5.85
Youngstown U5	5.50

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill.(1) L1	3.75
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt.Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32)B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.55
NewBritain (10) S15	4.00
NoTonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15	10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60
NewBritn,Conn.(10)S15	10.75
Pawtucket,R.I.(11)	10.75
Pawtucket,R.I.(12)	11.05
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40) T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...		7.70	9.65	
Carnegie,Pa. S18		6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65		
Detroit D2	5.60	6.65	7.25		
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...		7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8:					
Cleve.-or-Pitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	10.30	12.50	14.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork, W3	...	...	10.30	12.50	15.35

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower) Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

Key to Producers

A1	Acme Steel Co.
A3	Alan Wood Steel Co.
A4	Allegheny Ludlum Steel
A7	American Steel & Wire
A8	Anchor Drawn Steel Co.
A9	Angell Nail & Chaplet
A10	Armco Steel Corp.
A11	Atlantic Steel Co.
A13	American Cladmetals Co.
B1	Babcock & Wilcox Tube
B2	Bethlehem Steel Co.
B3	Beth. Pac. Coast Steel
B4	Blair Strip Steel Co.
B5	Bliss & Laughlin Inc.
B6	Boiardi Steel Corp.
B8	Braeburn Alloy Steel
B11	Buffalo Bolt Co.
B12	Buffalo Steel Co.
B14	A. M. Byers Co.
C1	Calstrip Steel Corp.
C2	Calumet Steel Div. Borg-Warner Corp.
C4	Carpenter Steel Co.
C5	Central Iron & Steel Div. Barium Steel Corp.
C7	Cleve. Cold Rolling Mills
C8	Cold Metal Products Co.
C9	Colonial Steel Co.
C10	Colorado Fuel & Iron
C11	Columbia Steel Co.
C12	Columbia Steel & Shaft.
C13	Columbia Tool Steel Co.
C14	Compressed Steel Shaft.
C16	Continental Steel Corp.
C17	Copperweld Steel Co.
C18	Crucible Steel Co.
C19	Cumberland Steel Co.
C20	Cuyahoga Steel & Wire
C22	Claymont Steel Corp.
D2	Detroit Steel Corp.
D3	Detroit Tube & Steel
D4	Disston & Sons, Henry
D6	Driver Harris Co.
D7	Dickson Weatherproof Nail Co.
E1	Eastern Gas&Fuel Assoc.
E2	Eastern Stainless Steel
E4	Electro Metallurgical Co.
E5	Elliott Bros. Steel Co.
E6	Empire Steel Corp.
F2	Firth Sterling Steel
F3	Fitzsimons Steel Co.
F4	Follansbee Steel Corp.
F5	Franklin Steel Div., Borg-Warner Corp.
F6	Fretz-Moon Tube Co.
F7	Ft. Howard Steel & Wire
G1	Geneva Steel Co.
G2	Globe Iron Co.
G3	Globe Steel Tubes Co
G4	Granite City Steel Co
G5	Great Lakes Steel Corp
G6	Greer Steel Co.
H1	Hanna Furnace Corp.
I-1	Igoe Bros. Inc.
I-2	Inland Steel Co.
I-3	Interlake Iron Corp.
I-4	Ingersoll Steel Div. Borg-Warner Corp.
J1	Jackson Iron & Steel Co.
J3	Jessop Steel Co.
J4	Johnson Steel & Wire Co.
J5	Jones & Laughlin Steel
J6	Joslyn Mfg. & Supply
J7	Judson Steel Corp.
J8	Jersey Shore Steel Co.
K1	Kaiser Steel Corp.
K2	Keokuk Electro Metals
K3	Keystone Drawn Steel
K4	Keystone Steel & Wire
L1	Laclede Steel Co.
L2	LaSalle Steel Co.
L3	Latrobe Electric Steel
L5	Lockhart Iron & Steel
L6	Lone Star Steel Co.
L7	Lukens Steel Co.

STRIP, Hot-Rolled Ingot Iron	
Ashland,Ky. (8) A10	3.75
Warren,O. R2	4.10

STRIP, Cold-Rolled Ingot Iron	
Warren,O. R2	5.25

TIGHT COOPERAGE HOOP	
Atlanta A11	4.05
Riverdale,Ill. A1	3.90
Sharon,Pa. S3	4.15
Youngstown U5	3.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld	Galv.
AlabamaCity R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19) K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora A7	5.70	6.15
Duluth A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts.Calif. C11	6.65	6.80
Prtsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.65	7.10
Sparrows Pt. B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

WIRE, (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1) K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsvle M8	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass.W12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth.(18) P12	10.55	12.30
SparrowsPt. B2	10.35	12.25
Waukegan A7	10.25	12.15

ROPE WIRE	(A)	(B)
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Cleveland A7	8.55	8.80
Donora,Pa. A7	8.55	8.80
Fostoria, O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
NewHaven A7	8.85	8.10
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt. B2	8.65	8.90
Struthers, O. Y1	8.55	8.80
Trenton,N.J. A7	8.85	9.10
Waukegan,Ill. A7	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon	
AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill.(1) L1	4.85
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	5.10
Cleveland A7, C20	4.85
Crawfordsville,Ind. M8	5.10
Donora,Pa. A7	4.85
Duluth,Pa. A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet, Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.95
LosAngeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark, 6-8ga. I-1	5.50
No. Tonawanda B11	4.85
Palmer,Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin,Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill. A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. M8	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
FranklinPark,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) N8	6.85
Trenton,N.J. R5	6.15
Worcester A7	6.15
Worcester T6	6.50
Worcester W12	6.65

WIRE, Fine & Weaving(8" Coils)	
Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. M8	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill. A7	8.90
Worcester,Mass. A7, T6	9.20

WIRE, Galv'd ACSR For Cores	
Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.60
Johnstown,Pa. B2	8.50

WIRE, Tire Bead	
Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.25
Alton,Ill.(1) L1	6.25
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass.(12) N6	8.05
Monessen,Pa. P7, P16	6.25
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.55
Portsmouth,O. P12	6.25
So.Chicago,Ill. R2	6.25
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass. J4	6.75

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	7.10
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	7.10
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½ Ga.	Col.
AlabamaCity,Ala. R2	126
Ala.City,Ala.,17-18ga.R2	213
Aliquippa,Pa.9-14½ga.J5	130
Atlanta A11	133
Bartonville,Ill.(19) K4	130
Crawfordsville,Ind. M8	132
Donora,Pa. A7	130
Duluth A7	130
Fairfield,Ala. T2	130
Houston,Tex. S5	138
Johnstown,Pa. B2	130
Johnstown,17ga.,6" B2	204
Johnstown,17ga.,4" B2	207
Joliet,Ill. A7	130
KansasCity,Mo. S5	142
Kokomo,Ind. C16	132
Minnequa,Colo. C10	138
Monessen,Pa. P7	135
Pittsburg,Calif. C11	153
Portsmouth,O.(18) P12	137
Rankin,Pa. A7	130
So. Chicago,Ill. R2	126
Sterling,Ill.(1) N15	130

FENCE POSTS	Col.
ChicagoHts.,Ill. C2	140
Duluth A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago R2	140
Tonawanda B12	140
Williamsport,Pa. S19	150

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	136
Aliquippa,Pa. J5	140
Atlanta A11	143
Bartonville,Ill.(19) K4	143
Crawfordsville M8	145
Donora,Pa. A7	140
Duluth,Minn. A7	140
Fairfield,Ala. T2	140
Houston,Tex. S5	148
Johnstown,Pa. B2	140
Joliet,Ill. A7	140
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	146
Monessen,Pa. P7	145
Pittsburg,Calif. C11	160
Portsmouth,O.(18) P12	147
Rankin,Pa. A7	140
So.Chicago,Ill. R2	136
So.SanFran.,Calif. C10	160
SparrowsPoint,Md. B2	142
Sterling,Ill.(1) N15	140

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Crawfordsville M8	132
Donora,Pa. A7	123
Duluth A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburgh,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

NAILS & STAPLES, Non-Stock	
AlabamaCity,Ala. R2	6.10
Bartonville,Ill.(19) K4	5.95
Crawfordsville,Ind. M8	6.30
Donora,Pa. A7	5.95
Duluth A7	5.95
Johnstown,Pa. B2	5.95
Joliet,Ill. A7	5.95
Kokomo,Ind. C16	6.05
Minnequa,Colo. C10	6.20
Pittsburg,Calif. C11	6.90
Portsmouth,O. P12	6.25
Rankin,Pa. A7	5.95
So.Chicago,Ill. R2	6.10
SparrowsPoint,Md. B2	6.05
Sterling,Ill.(1) N15	5.65
Worcester,Mass. A7	6.25

NAILS, Cut (100 lb keg) To dealers (33)	
Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. W10	7.15

NAILS & STAPLES, Stock To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. M8	122
Donora,Pa. A7	118
Duluth A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

STANDARD TRACK SPIKES	
Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

TRACK BOLTS (20) Treated	
KansasCity,Mo. S5	9.85
Lebanon,Pa.(32) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.10

TIE PLATES	
Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS	
Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

AXLES	
Ind.Harbor,Ind. S18	5.60
Johnstown,Pa. B2	5.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...	(16)4.00
Lackawanna B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	23.00	13.5W,4Cr,3V	140.00
Extra Carbon	27.00	18W,4Cr,2V,9Co	217.50
Spec. Carbon	32.50	19W,4Cr,2V,7Co	217.50
Oil Hardening	35.00	18.25W,4.25Cr,1V,4.75Co	185.50
Cr Hot Wrk	35.00	20.25W,4.25Cr,1.6V,12.25Co	323.00
Hi-Carbon-Cr	63.50	1.5W,4Cr,1V,8.5Mo	78.50
18W,4Cr,1V	123.50	6.4W,4.5Cr,1.9V,5Mo	87.00
18W,4Cr,2V	138.00	6W,4Cr,3V,6Mo	109.50

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2, V3.

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c,finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. edge or square edge.
(33) To jobbers, deduct 20 cents.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

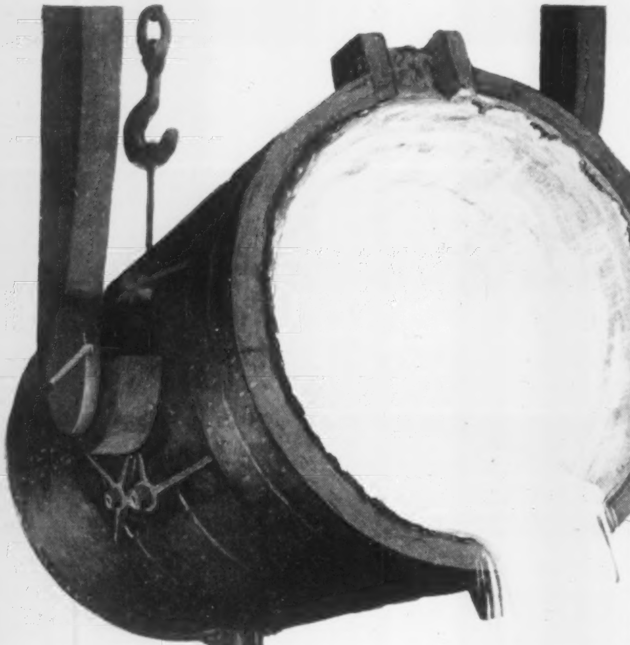
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube



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National Steel building new plant to produce 1,000,000 tons annually—cost $200 million . . .

both to be completed by 1952—with some units in production by end of 1951.

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Has the largest combined Capital and Surplus of any Philadelphia bank . . . $50 million . . . permitting individual loans up to $5 million.

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Has the biggest Foreign Department in Philadelphia . . . finances more exports and imports moving through the Port of Philadelphia than any other bank.

THE PHILADELPHIA NATIONAL BANK

Established 1803

PHILADELPHIA 1, PA.

Member Federal Deposit Insurance Corporation

STANDARD PIPE, T. & C.

Carload Discounts from List, %

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	29.0	1.5	+0.5	+3.5
¼	6.0	0.42	28.5	26.5	23.5	+1.0	+3.0	+6.0
⅜	6.0	0.57	23.5	21.5	18.5	+7.0	+9.0	+12.0
½	8.5	0.85	36.0	34.0	35.0	14.0	12.0	13.0
¾	11.5	1.13	39.0	37.0	38.0	18.0	16.0	17.0
1	17.0	1.68	41.5	39.5	40.5	21.5	19.5	20.5
1¼	23.0	2.28	42.0	44.0	41.0	22.0	24.0	21.0
1½	27.5	2.78	42.5	41.5	41.5	23.0	21.5	22.0
2	37	3.68	43.0	41.0	42.0	23.5	21.5	22.5
2½	58.5	5.82	43.5	41.5	42.5	24.0	22.0	23.0
3	76.5	7.62	43.5	41.5	42.5	24.0	22.0	23.0

Column A: Etna, Pa. N2; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼" and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜". Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4". Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y1; Alton, Ill. (Gary base) L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 3½% on ⅛", plus 2½% on ¼"; plus 9% on ⅜"; Sharon, Pa. M6, plus 0.5 on ⅛", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 16½% on 3½" and 4"; Youngstown Y1, Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½ points lower on 1¼", 2 points lower on 1½" and 2", 1½ points lower on 2½" and 3"; Etna, Pa. N2 and 18½% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD

Carload Discounts from List, %

Size Inches	List Per Ft	Pounds Per Ft	Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	9.5	29.5	9.5
2½	58.5	5.82	32.5	12.5	32.5	12.5
3	76.5	7.62	32.5	12.5	32.5	12.5
3½	92.0	9.20	34.5	14.5	34.5	14.5
4	$1.09	10.89	34.5	14.5	34.5	14.5
5	1.48	14.81	37.0	17.0	37.0	17.0
6	1.92	19.18	37.0	17.0	37.0	17.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2¼	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Strip Cold-Rolled Carbon Base 10%	Strip Cold-Rolled Carbon Base Both Sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Cu Base Both Sides
302	....	....	....	....	19.75	27.50	77.00
304	25.00	28.00-29.50	....	....	20.75-21.50	27.50	77.00
309	30.50	35.00	....	....	....	....	....
310	36.50	41.00	....	....	....	....	144.00
316	29.50	31.50-34.00	....	....	26.00	36.50	....
317	34.50	39.00	....	....	....	....	....
318	38.50	38.00	....	....	....	....	....
321	26.50	31.00	....	....	23.00	33.00	111.00
347	27.50	30.50-32.00	....	....	24.00	33.50	130.00
405	21.25	27.75	....	....	....	....	....
410	20.75	27.25	....	....	....	....	....
Nickel	33.25	44.25	41.00	54.00	....	....	....
Inconel	41.00	53.50	....	....	....	....	165.00
Monel	34.75	45.75	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	15
9/16-in. & ⅝-in.	18.5
¾-in. and larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, al diams.:	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap, and Sleigh Shoe	21
Tire bolts	12
Boiler & Fiting-Up bolts	31

NUTS

H.P. & C.P.	Reg.	Heavy
Square:		
½-in. & smaller	15	15
9/16-in. & ⅝-in.	12	6.5
¾-in.-1½-in.	9	1
1⅝ in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
9/16-in. & ⅝-in.	16.5	6.5
¾-in.-1½-in.	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.		
½-in. & smaller	26	22
9/16-in. & ⅝-in.	23	17.5
¾-in. & 1½-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or key quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
9/16-in. & ⅝-in.	29.5	22
¾-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
	Light	
7/16-in. & smaller	35	
½-in. to ⅝-in.	28.5	
¾-in. to 1½-in.	26	

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	42
¾-in. through 1 in.	34
Longer than 6 in.:	
⅝-in. & smaller	26
¾-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger	7.85c
7/16-in. under	36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..List to list-plus-50c.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Inches Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
4,5⅛	40	21.50
3	40	22.61
2½	24,30	23.15
2	24,30	25.36

CARBON

Inches Diam.	Inches Length	Cents per lb
40	100,110	8.03
35	100,110	8.03
30	84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03
14	60,72	8.57
10,12	60	8.84

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.00	36.50	31.25
303	43.00	40.00	33.75
304	43.00	38.50	32.75
309	55.50	54.50	44.25
316	56.50	58.50	48.75
321	49.00	48.00	36.75
347	53.50	52.00	41.25
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Baltimore, Types 301 through 347 sheet, except 309 E2.
Brackenridge, Pa., sheets A4.
Bridgeville, Pa., bars, wire, sheets & strip U4.
Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.
Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502, S18.
Cleveland, strip A7.
Detroit, strip, except Types 309, 321, 416, 420, 501 and 502 M1.
Dunkirk, N.Y., bars, wire A4.
Duquesne, Pa., bars U5.
Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6.
Gary, Ind., sheets except Type 416 U5.
Harrison, N. J., strip C18.
McKeesport, Pa., bars, sheets except Type 416 U5.
McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.
Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars U5.
Pittsburgh, sheets C18.
Reading, Pa., bars and strip, except 55.50c for Type 309 strip and 44.75c for Type 309 bars, C4.
Sharon, Pa., strip, except Types 303, 309, 316, 416, 501 and 502 S3.
So. Chicago, Ill., bars & structurals U5.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars U4.
Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.
Washington, Pa., bars, sheets & strip, except Type 309 sheets 56.00c and bars 44.75c, J3.
Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 61.50c, strip 63.00c, W4.
Watervliet, N. Y., structurals & bars A4.
Waukegan, bars & wire A7.
West Leechburg, Pa., strip, A4.
Youngstown, strip, except Types 303, 3099, 316, 416, 501 and 502 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens	
Pure benzol	30.00-35.00
Toluol, one deg.	26.00-33.00
Industrial xylol	25.00-33.50
Per ton bulk, ovens	
Sulphate of ammonia	$32-$45
Cents per pound, ovens	
Phenol, 40 (carlots, non-returnable drums)	17.25
Do., less than carlots	18.00
Do., tank cars	15.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron	Cents
98+% Fe, carlots	16.00
Swedish, c.i.f. New York, in bags	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	42.50
Unannealed, 99+% Fe	36.50
Unannealed, 99+% Fe (minus 325 mesh)	58.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	33.50
Brass, 10-ton lots	30.00-33.25
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 10 tons	50.00
Copper:	
Electrolytic	43.25
Reduced	33.75-37.00
Lead	25.50
Magnesium	75.00-85.00
Manganese:	
Minus 100-mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	83.00
Nickel-Silver, 10-ton lots	44.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainles Steel, 302	83.00
Zinc, 10-ton lots	23.00-30.50
Tungsten:	Dollars
99%, minus 80 to 200 mesh, freight allowed:	
1000 lb and over	4.00
Less than 1000 lb	4.15
98.8% minus 65 mesh, freight allowed:	
1000 lb. and over	4.15
less than 1000 lb.	4.25
Molybdenum:	
99%, minus 80 to 200 mesh,	
over 500 lb.	2.85
200 to 500 lb.	3.10
less than 200 lb	3.25
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

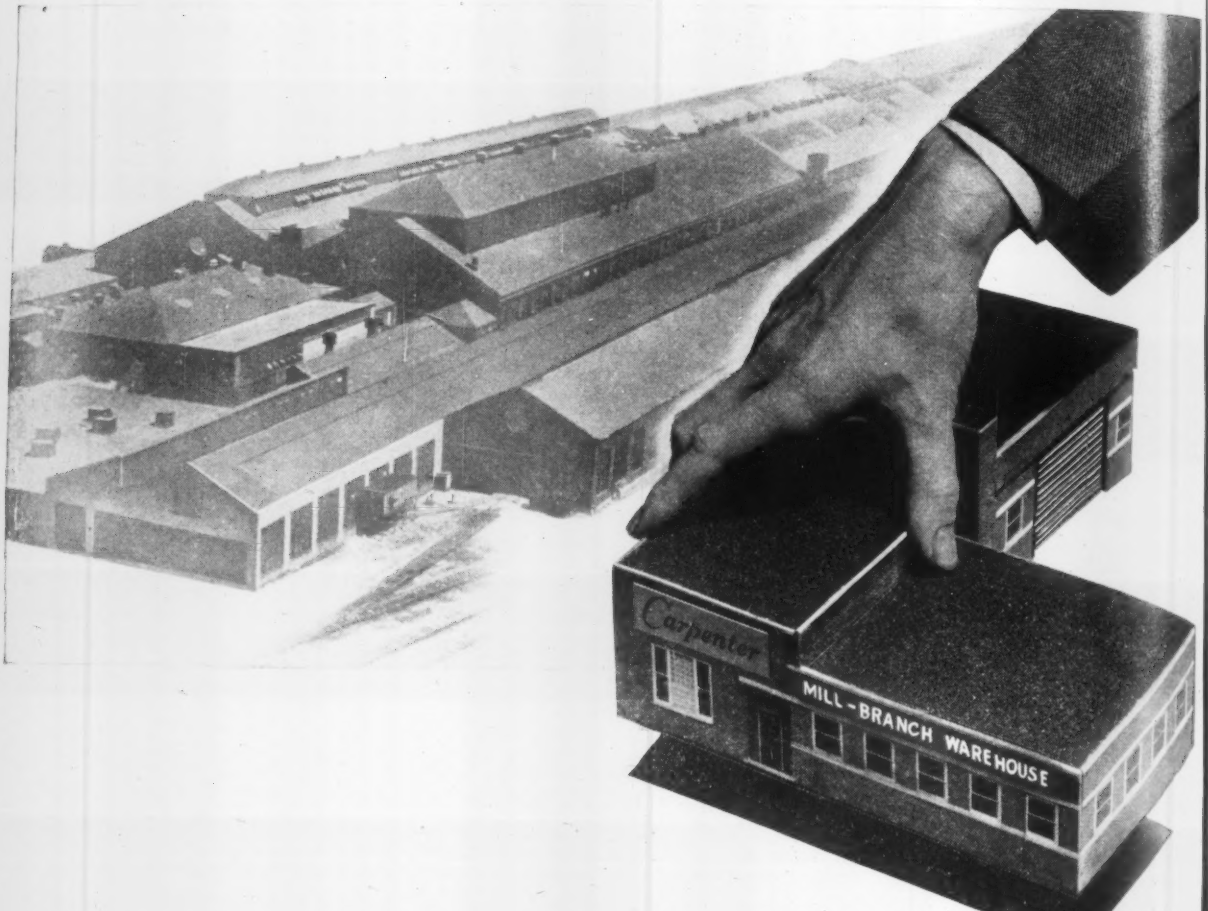
BEEHIVE OVENS

Connellsvll.fur.	$14.50-15.00
Connelsvll.fdry.	17.00-18.00
New River, foundry	21.30
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens	$22.75
Everett, Mass., ovens	
New England, del.	*24.80
Chicago, ovens	23.00
Chicago, del.	24.40
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.28
Cincinnati, del.	25.73
Detroit, del.	26.71
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesvile, O., ovens	24.00
Cleveland, del.	25.75
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Birmingham, del.	21.69
Philadelphia, ovens	22.70
NevilleIsland,Pa.,ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.75
Flint, del.	26.49
Pontiac, del.	25.42
Saginaw, del.	26.81

* Or within $4.15 freight zone from works.



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SPECIALTY TOOL • ALLOY • AND • STAINLESS STEELS

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York (c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.10	6.28	7.74
Boston (city)	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	6.98	7.88
Boston (c'try)	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	6.78	7.68
Phila. (city)	7.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try)	6.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city)	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.00	7.64
Balt. (c'try)	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va.	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va.	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.05	7.80
Wash. (w'hse)	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.)	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††⁵	6.00	6.25	7.55
Buffalo (w'hse)	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††⁵	5.80	6.05	7.35
Pitts. (w'hse)	5.60	6.40*	7.75	5.65-5.95	6.90	5.55	6.40	10.10††	5.70	5.75	7.00
Detroit (w'hse)	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.32
Cleve. (w'hse)	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city)	6.02	6.59	7.34	5.95	...	5.95	6.51	...	6.24	6.34	7.50
Chicago (city)	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwaukee (city)	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try)	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.)	6.05	6.85	8.20	6.00	...	6.00	6.85	10.55	6.23	6.33	7.53
St. L. (w'hse)	5.85	6.65	8.00	5.80	...	5.80	6.65	10.35	6.03	6.13	7.33
Kans. City (city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
KansCity (w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city)	5.75	6.55	6.90²	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm. (w'hse)	5.60	6.40	6.75³	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05³	6.60	8.90	6.55	7.75	...	6.55	6.60	9.20
L. A. (w'hse)	6.35	7.90	8.85³	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
San Francisco	6.65	7.80⁴	8.90³	6.60	...	6.45	8.20	...	6.45	6.50	8.60
Seattle-Tacoma	7.05	8.60³	9.20³	7.30	...	6.75	9.10	11.15	6.65	6.75	8.80

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded; ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ²—500 to 1499 lb; ³—450 to 1499 lb; ⁴3500 lb and over; ⁵—1000 to 1999 lb.

ORES

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit, del. E. Pa.

Foundry and basis 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Indian manganese, 46-48%, nearby, 92.00-96.00c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.8c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$27.00-28.00
45% no ratio	20.00
48% no ratio	34.00-35.00
50% no ratio	28.00-28.50

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00

Domestic—rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $75, Palmerton, Pa.; $75, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185 per gross ton of alloy, c.l. packed, $197; gross ton lots, packed, $212; less gross ton lots, packed, $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Welland, Ont., or Ashtabula, O. Base price: $187, Johnstown, Pa.; $185, Sheridan, Pa.; $188, Etna, Pa.; $190, Chattanooga, Tenn. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244 f.o.b. Chicago. Add or subtract $2.30 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c, ton lot 27.6c, less ton 28.8c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max, 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max.). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 34c per lb of metal; packed, 34.75c; ton lot 36.25c; less ton lot 38.25c. Delivered, Spot, add 2c.

Manganese Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump bulk, 1.50% C grade, 18-20% Si 9.90c per lb of alloy, carload packed, 10.65c, ton lot 11.55c, less ton 12.55c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lot 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 21.75c per lb of contained Cr, c.l., packed 22.65c, ton lot 23.80c, less ton 25.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%.) Contract, carload, lump, bulk, max. 0.03% C 33.60c per lb of contained Cr, 0.04% C 31.50c, 0.06% C 30.50c, 0.10% C 30.00c, 0.15% C 29.75c, 0.20% C 29.50c, 0.50% C 29.25c, 1% C 29.00c, 1.50% C 28.85c, 2% C 28.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 23.25c per lb of contained Cr. C.l., packed 24.15c, ton 25.50c, less ton 27.25c. Delivered Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 MxD, 16.35c per lb of alloy; ton lot 17.2c; less ton lot, 18.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 21.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 21.90c per pound of contained chromium plus 12.60c per pound of contained silicon, F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 36-39%, Al 7-9%, C 0.05% max.) 21.75c per lb of contained silicon plus 12.4c per lb of contained silicon plus aluminum, 3" x down, delivered.

Chromium Metal: (Min. 97% Cr and 1% Fe) Contract carload, 1" x D; packed, max 0.50% C grade, $1.08 per lb of contained chromium ton lot $1.10, less ton $1.12. Delivered. Spot add 5c.

NOTE: Current prices on calcium, vanadium, zirconium, briquetted alloys and "other" ferroalloys, were published on page 163, *Apr.* 9 *issue; silicon, boron and tungsten alloys, page* 151, *May* 14 *issue. Current refractories prices also were published on page* 151, *May* 14, *issue.*

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Apr. 19, 1951

STEELMAKING SCRAP COMPOSITE

May 17	$44.00
May 10	44.00
Apr. 1951	44.00
May 1950	33.82
May 1946	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

No. 1 Heavy Melting Steel (Grade) 1

Basing Point	Dealer, Industrial	Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Point, Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2.	No. 2 Heavy Melting	— $2.00
3.	No. 1 Busheling	Base
4.	No. 1 Bundles	Base
5.	No. 2 Bundles	— 3.00
6.	Machine Shop Turnings	— 10.00
7.	Mixed Borings & Short Turnings	— 6.00
8.	Shoveling Turnings	— 6.00
9.	No. 2 Busheling	— 4.00
10.	Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11.	Billet, Bloom & Forge Crops	+ 7.50
12.	Bar Crops & Plate	+ 5.00
13.	Cast Steel	+ 5.00
14.	Punchings & Plate Scrap	+ 2.50
15.	Electric Furnace Bundles	+ 2.00
	Cut Structurals & Plate:	
16.	3 feet and under	+ 3.00
17.	2 feet and under	+ 5.00
18.	1 foot and under	+ 6.00
19.	Briquetted Cast Iron Borings	Base
	Foundry, Steel:	
20.	2 feet and under	+ 2.00
21.	1 foot and under	+ 4.00
22.	Springs and Crankshafts	+ 1.00
23.	Alloy Free Turnings	— 3.00
24.	Heavy Turnings	1.00

Special Grades

25.	Briquetted Turnings	Base
26.	No. 1 Chemical Borings	3.00
27.	No. 2 Chemical Borings	4.00
28.	Wrought Iron	10.00
29.	Shafting	10.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.
(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.
(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.
(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and open-hearth furnaces or foundries.
(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.
(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.
(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 heavy melting steel less $15.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap.

2.	No. 2 Heavy Melting Steel	— $2.00
3.	No. 2 Steel Wheels	Base
4.	Hollow Bored Axles and loco. axles with keyways between the wheelseats.	Base
5.	No. 1 Busheling	3.50
6.	No. 1 Turnings	— 3.00
7.	No. 2 Turnings, Drillings & Borings	— 12.00
8.	No. 2 Cast Steel and uncut wheelcenters	— 6.00
9.	Uncut Frogs, switches	Base
10.	Flues, Tubes & Pipes	— 8.00
11.	Structural, Wrought Iron and/or steel, uncut	— 6.00
12.	Destroyed Steel Cars	— 8.00
13.	No. 1 Sheet Scrap	— 9.50
14.	Scrap Rails, Random Lengths	+ 2.00
15.	Rerolling Rails	7.00
	Cut Rails:	
16.	3 feet and under	+ 5.00
17.	2 feet and under	+ 6.00
18.	18 inches and under	+ 8.00
19.	Cast Steel, No. 1	+ 3.00
20.	Uncut Tires	2.00
21.	Cut Tires	5.00
	Bolsters & Side Frames	
22.	Uncut	Base
23.	Cut	+ 3.00
24.	Angle, Splice Bars & Tie Plates	+ 5.00
25.	Solid Steel Axles	+ 12.00
26.	Steel Wheels, No. 3 oversize	Base
27.	Steel Wheels, No. 3	+ 5.00
28.	Spring Steel	5.00
29.	Couplers & Knuckles	+ 5.00
30.	Wrought Iron	+ 8.00
31.	Fireboxes	— 8.00
32.	Boilers	— 6.00
33.	No. 2 Sheet Scrap	— 13.00
34.	Carsides, Doors, Car Ends, cut apart	— 6.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.
(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.
(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

	Cast Iron:	
1.	No. 1 (Cupola)	$49.00
2.	No. 2 (Charging Box)	47.00
3.	No. 3 (Hvy. Breakable)	45.00
4.	No. 4 (Burnt Cast)	41.00
5.	Cast Iron Brake Shoes	41.00
6.	Stove Plate	46.00
7.	Clean Auto Cast	52.00
8.	Unstripped Motor Blocks	43.00
9.	Wheels, No. 1	47.00
10.	Malleable	55.00
11.	Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 3 cast iron.
(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 1, No. 2 or No. 3, $8.
(2) For hydraulically compressing Grade No. 4, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3.
(4) For preparing into Grade No. 25, $6.
(5) For preparing into Grade No. 19, $6.
(6) For preparing into Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) For preparing into Grade No. 17 or Grade No. 21, $11.
(8) For preparing into Grade No. 18 or Grade No. 20, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.
(3) For preparing into Grade No. 16, $4.
(4) For preparing into Grade No. 17, $5.
(5) For preparing into Grade No. 18, $7.
(6) For preparing into Grade No. 21, $4.
(7) For preparing into Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commissions shall be payable to a broker in excess of $1.

Unprepared Scrap

For unprepared scrap, other than materials suitable for hydraulic compression, ceiling basing point prices shall be $8 per ton beneath ceiling of the prepared base grades.

For unprepared material which when compressed constitutes No. 1 bundles, ceiling basing point price shall be $6 per ton beneath ceiling for No. 1 bundles; or when compressed constitutes No. 2 bundles ceiling basing point price shall be $8 beneath ceiling basing point price for No. 2 bundles.

Premiums for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:

Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c.
Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, 83c; Butler, Pa., 65c.
Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c.
Coatesville, Pa., 50c; Conshohocken, Pa., 20c.
Detroit, 95c; Duluth, Minn., 50c.
Harrisburg, Pa., 51c; Houston, Tex., 57c.
Johnstown, Pa., 75c.
Kansas City, Mo., 78c; Kokomo, Ind., 51c.
Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c.
Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c.
St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O., 51c.
Warren, Pa., 75c; Weirton, W. Va., 70c.
Youngstown, 75c.

HAMILTON, ONT.
(Delivered Prices)

Heavy Melt.	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	34.50
Mechanical Bundles	33.00
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	28.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory, prep'd	33.00
Bushelings new factory, unprep'd	28.00
Short Steel Turnings	28.00
Cast Iron Grades*	
No. 1 Machinery Cast	58.00-60.00

* F.o.b. shipping point.

The Metal Market

Requirements committee will establish procedures for balancing copper and aluminum supply with demand. NPA requires copper users to file monthly reports.

RESTRICTIONS on use of copper and aluminum will be tightened. Despite vigorous efforts made to bring requirements and supplies into balance, this goal has not been achieved. Study of reports required under the Controlled Materials Plan will reveal accurately the extent of the unbalance and what changes must be made in distribution of the metals.

A requirements committee has been formally established under chairmanship of Charles E. Wampler, director of Defense Production Administration's Office of Program and Requirements; Melvin L. Anshen, assistant director of that office, vice chairman. This committee is responsible for reviewing overall demands for copper and aluminum, as well as steel and other critical materials, and for recommending policies and procedures for balancing supply with demand.

Copper Reports — All companies using copper or copper-base alloy materials will be required to file a series of monthly reports of their operations beginning with April. National Production Authority took this action as a necessary step in making allotments of copper and copper products under CMP. Brass mills and copper wire mills and brass and bronze foundries will report, on form NPAF-84, deliveries of products classified by programs or end-use; on form NPAF-83, their inventory position, receipts and consumption of copper and copper-base materials. All other users of copper and dealers who own refined copper will report only on form NPAF-83.

Aluminum Scrap — Fabricators of wrought aluminum products can expect larger receipts of scrap soon. NPA officials and aluminum producers have endorsed a proposed revision of order M-22 which will stimulate the flow of scrap aluminum. The revision will be useful also in reducing the heavy drain on primary aluminum resulting from the present scrap shortage.

Look also for a revision in order M-5. Independent fabricators are not receiving sufficient aluminum for normal operation under provisions of the order as now written. The proposed amendment would define the term "independent fabricator" as a manufacturer of standard mill products (to be listed in the order) who supplies these materials for further fabrication.

International Metals Control

Richard Stokes, who holds the title of Lord Privy Seal in the British cabinet and is in charge of raw materials supply, said in Washington last week that he favors the formation of a Combined Raw Materials Board similar to the one in operation during World War II. He proposes international allocation of scarce, strategic raw materials like copper, zinc, tin, and rubber but had not discussed the project with Charles E. Wilson, director, Office of Defense Mobilization.

Titanium Demand Increases

A great demand for titanium metal is building up, reports National Lead Co., New York. The company's production of the metal has been on a small scale, but within a relatively short time its Henderson, Nev., plant should start producing on a tonnage basis. This project is a joint venture with Allegheny Ludlum Steel Corp., Pittsburgh.

Advocates Tariff Suspension

Temporary suspension of lead and zinc import tariffs, provided they are restored when prices drop below a specific level, is advocated by Clinton H. Crane, chairman, St. Joseph Lead Co. This action would facilitate the flow of these metals from abroad to supplement the domestic supply. Imports of refined lead dropped to only 35,319 tons in the first quarter, 1951, from 81,756 tons in the like period a year ago.

Consumers in this country must pay substantial premiums over domestic ceiling prices when they purchase lead and zinc from foreign producers. "Ceiling prices will run into increasing difficulties in the United States unless there is international control of distribution which I do not believe is practicable," Mr. Crane added.

The company's $15 million expansion and construction program, originally a 10-year project, has been telescoped to three years. About $4 million will be expended in 1951; around $6 million in 1952 and $5 million in 1953.

St. Joseph Lead Co. will import 10,000 tons of zinc concentrates from properties of its subsidiary in Argentina for treatment at the St. Josephtown, Pa., electrothermic smelter. It is doubtful if the company can obtain another permit from the Argentine government for additional exports of concentrates.

Copper Stocks Decline

Stocks of refined copper declined to 52,800 tons in April from 55,609 tons at the end of March as production dropped to 103,494 tons from 112,933 tons while deliveries eased to 114,744 tons from 116,793 tons. Production of blister copper declined slightly to 83,708 tons from 85,060 while secondary producers turned out 7347 tons compared with 6183 tons in March.

Cerro de Pasco Changes Name

Cerro de Pasco Copper Corp., New York, will change its corporative title in June to Cerro de Pasco Corp. Copper is being eliminated from the title because that metal no longer is the major production item of the firm. Cerro de Pasco's zinc refinery development is well under way with the total cost of this program estimated at between $24 and $30 million reports Robert P. Koenig, president of the company.

WATCHING CHIPS FLY: Magnesium plate gets a curved bevel from this machine at the East Chicago, Ind., plant of Magnesium Co. of America. The operation—one step in fabrication of dockboards—graphically demonstrates to Magcoa dealers the ease with which magensium is machined

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c. Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 29.00c; 88-10-2 (No. 215) 44.50c; 80-10-10 (No. 305) 35.00; No. 1 yellow (No. 405) 25.50c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.85c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 30.75-32.50c; No. 12 foundry alloy (No. 2 grade) 30.75-31.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 32.75-33.50c; grade 2, 30.00-31.50c; grade 3, 30.00-30.50c; grade 4, 28.50-30.00c. Prices include freight at c.l. rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 139.00.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 50.50c; 25-lb pigs, 53.15c; "XX" nickel shot, 54.15c; "F" nickel shot or ingots, for addition to cast iron, 51.00c. Prices include import duty.

Mercury: Open market, spot, large lots, New York, $215-$220 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.10 per lb for 500 lb (kegs); $2.12 per lb for 100 lb (case); $2.17 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 90.16c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 41.03; yellow brass 37.84; commercial bronze, 95%, 40.99; 90%, 40.55; red brass, 85%, 39.59; 80%, 39.15; best quality, 39.15; nickel silver, 18%, 51.91-52.36; phosphor-bronze grade A, 5%, 60.20-62.82.

Rod: Copper, hot-rolled 36.88; cold-drawn 38.13; yellow brass free cutting, 32.23; commercial bronze, 95%, 40.68; 90%, 40.24; red brass 85%, 39.28; 80%, 38.84.

Seamless Tubing: Copper 41.07; yellow brass 40.85; commercial bronze, 90%, 43.21; red brass, 85% 42.50.

Wire: Yellow brass 38.13; commercial bronze, 95%, 41.28; 90%, 40.84; red brass, 85%, 39.88; 80%, 39.44; best quality brass, 39.44.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-30.295; l.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l. 30.10, l.c.l. 30.18, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

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* Lenghts 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	——Hexagonal—— R317-T4	17S-T4
0.125	52.0	...	...
0.156-0.188	44.0	...	...
0.219-0.313	41.5	...	...
0.375	40.0	46.0	48.0
0.406	40.0	...	...
0.438	40.0	46.0	48.0
0.469	40.0	...	...
0.500	40.0	46.0	48.0
0.531	40.0	...	...
0.563	40.0	...	45.0
0.594	40.0	...	...
0.625	40.0	43.5	45.0
0.688	40.0	...	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	...	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	...	...
1.625	36.5	...	39.5
1.688-2.000	36.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $22.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 24.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in., 23.50-24.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 71.50c. Strip, cold-rolled, 77.50c. Rods and shapes, 67.50c. Plates, 69.50c. Seamless tubes, 100.50c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 57.00c. Strip, cold-rolled 60.00c. Rods and shapes, 55.00c. Plates, 56.00c. Seamless tubes, 90.00c. Shot and blocks, 50.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 37.69c; oval 37.19c. Cast 37.375c, delivered in eastern territory.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 60.8c, under 1000 lb 62.8c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98% ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,900 lb, 18.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 29.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 68.50c; 10,000 to 30,000 lb, 69.50c; 3000 to 10,000 lb, 70.50c, 500 to 3000 lb 71.50c; 100 to 500 lb, 73.50c; under 100 lb, 76.50c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 35.00c; 400-lb bbl. 33.00c up to 10,000 lb, 32.50c; over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more drums, 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 20,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	23.00	23.00	22.25
Yellow Brass	20.125	19.875	18.75
Commercial Bronze			
95%	21.875	21.625	21.125
90%	21.75	21.50	21.00
Red Brass			
85%	21.50	21.25	20.75
80%	21.375	21.125	20.625
Muntz metal	19.00	18.75	18.25
Nickel, silver, 10%	22.25	22.00	11.125
Phos. bronze, A	24.00	23.75	22.75

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 30.00; No. 2 copper 28.00; light copper 27.00; composition red brass 25.50-26.00; radiators 20.50-21.00; heavy yellow brass 20.00-20.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 21.50*; No. 2 copper 20.00*; light copper 19.00*; refinery brass (60% copper) per dry coper content 20.00.

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* Nominal.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 25.50-26.50; No. 2 24.00-25.00; light copper 22.00-22.50; No. 1 composition red brass 22.00-23.00; No 1 composition turnings 21.00-22.00; mixed brass turnings 13.00; new brass clippings 20.00-21.00; No. 1 brass rod turnings 19.00; light brass 15.00; clean heavy yellow brass 17.50; new brass rod ends 19.50; auto radiators 17.50-18.00; cocks and faucets, 19.00-19:50; brass pipe 20.00-20.50.

Lead: Heavy 16.50-16.75; battery plates 9.50-10.00; linotype and stereotype 17.00; electrotype 15.75-16.00; mixed babbitt 17.00.

Zinc: Old zinc 12.50-13.00; new die cast scrap 12.50-13.00; old die cast scrap 8.25-8.50.

Tin: No. 1 pewter 80.00-85.00; block tin pipe 110.00-120.00; No. 1 babbitt 70.00-75.00.

Aluminum: Clippings 2S 21.50-22.00; old sheets 17.00-17.50; crankcase 17.00-17.50; borings and turnings 13.00-14.000.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
May 10-17	24.50	16.80	17.50	139.00	19.00	42.00	50.50	90.16
May 1-9	24.50	16.80	17.50	142.00	19.00	42.00	50.50	90.16
Apr. 17-30	24.50	16.80	17.50	142.00	19.00	42.00	50.50	90.16
Apr. 12-16	24.50	16.80	17.50	147.00	19.00	42.00	50.50	90.16
Apr. 9-11	24.50	16.80	17.50	150.50	19.00	42.00	50.50	90.16
Apr. 6-7	24.50	16.80	17.50	150.00	19.00	42.00	50.50	90.16
Apr. 5	24.50	16.80	17.50	149.875	19.00	42.00	50.50	90.16
Apr. 4	24.50	16.80	17.50	150.00	19.00	42.00	50.50	90.16
Apr. 3	24.50	16.80	17.50	149.50	19.00	42.00	50.50	90.16
Apr Avg.	24.50	16.80	17.50	145.735	19.00	42.00	50.50	90.16
Mar. Avg.	24.50	16.80	17.50	145.730	19.00	42.00	50.50	90.16
Feb. Avg.	24.50	16.80	17.50	182.716	19.00	42.00	50.50	90.16
Jan. Avg.	24.50	16.80	17.50	171.798	19.00	35.462	50.50	88,890

NOTE: Copper; Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plates . . .

Plate Prices, Page 145

Philadelphia—Plate production here is due for early curtailment because of necessary mill repairs. Claymont Steel Corp. will close down its 120-in. mill May 26 for six weeks. Alan Wood Steel Co. will close down the finishing mill in its plate department during July.

Pittsburgh — Tightness in steel plates continues with demand pressure strong. Producers see little early relief even under CMP. DO set-asides are booked into fourth quarter.

Seattle—Plate fabricators are sidestepping jobs lacking DO priorities. Bids are in to U. S. Engineer, Seattle, for 3000 tons for 10 gas storage tanks for the Mukilteo, Wash., naval depot. Tacoma seeks 1400 tons for a water line.

Sheets, Strip . . .

Sheet and Strip Prices, Page 145 & 146

Chicago—Mill set-aside for hot-rolled sheets in June for defense orders is 30 per cent. On this basis first openings of some producers is January. "Free" tonnage is undergoing a squeeze. Hot-rolled strip set-aside is only 16 per cent, but June, 1952, is first month in which DO orders for rolled edge orders can be booked and February for slit edge. November is first month open for galvanized rated tonnage.

Boston—Not only are more products included in interim CMP orders, but rated orders for third quarter are automatically increased by a provision under DO-70 centering around production during the base period, 105 per cent steel, first three months, 1950. This means numerous shops can procure more steel than was ordered and delivered during the base period in that they drew from inventory for part of their requirements. Not only will these shops get replacements on what was ordered during the base period, but also what was taken from inventory, in that production or consumption of steel is the criterion.

Pittsburgh—Demand pressure for sheets is high and the forthcoming CMP and decreases in automotive consumption will not ease the situation noticeably. CMP clinic is scheduled for May 22 in this area. Producers are reluctant to book defense orders far in advance and non-rated orders are being held out pending more information on distribution policies.

Cleveland—Not much open tonnage is expected to be leftover for the general market after defense and essential needs are taken care of under the Controlled Materials Plan. Producers of flat-rolled products, now booked months ahead on DO tonnage, do not anticipate any particular easing in supply conditions soon despite cutbacks in household appliances, automobiles and other civilian goods items.

Cincinnati—Tentative sheet schedules for July are being prepared while details of CMP directives are awaited. Allotments for non-defense needs will be cut modestly under June tonnages.

New York—Pending clarification as to July requirements, some leading sheetmakers are not accepting non-rated carbon tonnage for that month. Actually, they are not even accepting rated tonnage until more details are available as to needs.

Philadelphia—Sheet makers think it will be fourth quarter before transition to the Controlled Materials Plan is completed. Meanwhile, they are concerned with immediate problems attending scheduling of July rollings.

Steel Bars . . .

Bar Prices, Page 145

Cleveland—With delivery promises on rated work extending months ahead barmakers are uncertain how much tonnage will be available in last half of the year for nonrated accounts. The Controlled Materials Plan becomes effective July 1 but not much tonnage is likely to be squeezed out of current rated commitments for the general market.

Chicago—Shell steel requirements will bite heavily into bar production in fourth quarter. It is not expected much of the tonnage will be asked for in third quarter. For June NPA set-aside for hot-rolled carbon bars for defense rated orders is 35 per cent and on this basis first opening a local barmaker has for new business is November-December rolling cycle. August is first month DO orders can be taken for alloy bars.

Pittsburgh—Large size bars are scarce. Some sellers are booked into 1952. On smaller bars third quarter promises are common. Defense and defense-support requirements are mounting. Alloy bars continue in very short supply.

New York—Mills have until June 1 to round out schedules for July on carbon bars. Some report a flood of DO orders. Many rated numbers are new and sellers are moving cautiously in accepting orders.

Philadelphia — Lead-time on hot-rolled carbon bars for July rolling has been cut to 30 days. At the moment most producers can promise nothing on DO-rated work before fourth quarter.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 145

Boston—Up to 13.00c per pound in place is bid on some concrete bar projects, but the average is closer to 1.00c per pound higher than several months back, or around 11.00c. Demand is well in excess of supply.

Seattle — Pressure for reinforcing bars is strong. Backlogs extend about six months. Public work is outstanding but private jobs also are active. Seattle Orthopedic hospital will require 1200 tons.

Tin Plate . . .

Tin Plate Prices, Page 146

Chicago—October is the first month a local tin plate producer can book additional rated hot dip tonnage. Until two weeks ago, July was the first month. First open month for electrolytic tin plate for defense is September.

San Francisco—Pacific Can Co. is oversold for the remainder of the year. Some government business has been taken and so far necessary raw materials have been forthcoming.

Structural Shapes . . .

Structural Shape Prices, Page 145

Pittsburgh—Structurals are in extremely short supply. Fabricators are reluctant to take any but rated construction jobs. Defense and defense-support programs are taking most of the tonnage in this area.

Philadelphia—One leading shape producer will have no free tonnage for July, supporting Washington predictions there will be no "free area" of construction after July 1 for months to come.

Boston — Some 17,500 tons have been assigned 47 of 48 Massachusetts projects, mostly bridges. Tightening plain structural material is narrowing volume being estimated for fabrication.

New York—Uncertainties with regard to steel and supply of other basic materials are holding up considerable structural demand.

San Francisco—Value of building permits issued in San Francisco totaled $5,662,389 in April compared with $6,943,202 in March and $5,412,549 in April, 1950. Total for 252 cities of the Far West were $202,682,006 for April against $203,304,823 in April, 1950, the all-time April peak.

Seattle—Structural awards for McNary dam totaled 3500 tons recently. Pending contracts include 4000 tons for spillway gates, bids May 30.

Warehouse . . .

Warehouse Prices, Page 151

Cleveland—Replenishment of stocks is hoped for next month when revised NPA order M-6 becomes fully effective. Under this the mills must provide distributors with 85 per cent of their carbon steel receipts in first nine months of 1950. Alloy and stainless steels do not come under this order. Price action by the Office of Price Stabilization pends. Latest word is the order will include a provision closely controlling "gray" market prices.

About 25 warehouses carrying stocks at some 40 distributing points have been designated by the National Production Authority to handle inspected aircraft alloy steels. These warehouses have been given a directive against necessary tonnage to care for aircraft needs into September.

Pittsburgh — Demand pressure on distributors increases. Receipts from mills are improving but tonnage falls short of demand. Plates, structural shapes and bars are in shortest supply. Sheets are almost as scarce. CMP clinic will be held here May 22.

Philadelphia — Warehouses anticipate some falling off in business this month because of depleted inventories. Most sellers are short of carbon bars and plates, but particularly alloy specialties.

Cincinnati—More inquiries are being received by warehouses, including some from distant points. Structurals, sheets and plates are particularly scarce.

San Francisco — Warehouse demand is strong and supplies limited.

Seattle — Warehouse business is spotty because of limited stocks. Sheets and plates are especially scarce.

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Semifinished Steel . . .

Semifinished Prices, Page 145

Los Angeles — Bethlehem Pacific Coast Steel Corp. has filed a petition against the Los Angeles County Smog Control District to prevent closing down three open hearth furnaces. The producer estimates 6000 tons of finished steel monthly would be lost.

Tubular Goods . . .

Tubular Goods Prices, Page 149

Los Angeles—Small DO backlogs, coupled with reductions in allocations of tubing, and restrictions against nickel and chrome, have caused one furniture manufacturer to go on a three-day work week.

Seattle—Spring cast iron pipe requirements in this area have been covered. Corvallis, Oreg., takes bids May 21 for 1000 tons.

Pig Iron . . .

Pig Iron Prices, Page 144

Chicago—Few foundries are getting all the pig iron required but are able to maintain operations reasonably well. Factors making this possible are well scheduled shipments against quotas by suppliers, occasional availability of foreign iron and adequacy of freight cars to handle shipments. Iron inventories are very low and improvement is out of the question because of demand for blast furnace metal in steelmaking. Of the district's 42 blast furnaces all are active currently. Youngstown Sheet & Tube Co. restored its No. 5 Iroquois stack at south Chicago on May 13, down since Mar. 26 for relining.

Cleveland—Pig iron supply conditions promise to tighten further late this summer when at least one district blast furnace will go down for repairs. Office of Price Stabilization is considering a dollar-and-cents ceiling price regulation on pig iron. It is proposed to establish ceilings by applying the general formula for the manufacturers' order CPR 22, which specifies pre-Korean base plus actual increases in factory payroll and material costs through certain cutoff dates.

Pittsburgh—Some users have low inventories but the major problem is still scrap. Partial curtailment of some foundry operations because of scrap shortage eases the pig iron situation slightly. Only one blast furnace in this area is down for repairs.

Buffalo—Shipments of iron to the East have been reduced to a minimum as one of the leading producers operates on a curtailed basis with one idle stack. Little change, however, is noted in a sustained movement of iron to Michigan motor sources.

New York—Pig iron consumers confront increasing supply stringency, but few have cut production to less than five days a week. Early relief is necessary to prevent some suspensions. Imports against old orders are uncertain, due to tight ocean shipping. Some German foundry iron for July-August delivery is offered at around $90 c.i.f.; some Turkish around $76 c.i.f., delivery in four to five months.

Philadelphia—Short pig iron supply is causing some foundries to curtail operations. Foreign iron still is being offered but at prices well above the domestic market.

Cincinnati—Shipments of pig iron are being held to previous allocations, supplies proving the bottleneck preventing expansion in the foundry melt. Trend in demand for machine tool castings is up.

San Francisco—United States Steel Corp. has leased Kaiser-Frazer Parts Corp.'s idle blast furnace at Ironton, Utah. The stack, with annual capacity of 300,000 tons, will be reactiviated within 40 days. No increase in merchant pig iron supply will result since output is destined for Geneva Steel Co.'s open hearths at Geneva, Utah. Kaiser purchased the furnace from the government at the end of World War II for $1,510,000 and operated it until May, 1949, when it was placed in standby condition. U. S. Steel's lease is for five years with an option to buy.

Los Angeles—Shortage of pig iron has caused melters to reduce pig iron charge 50 per cent. Chilean iron is still available.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 149

Cleveland—There is nothing in the coke market outlook to indicate any substantial change in supply and demand over coming months. The past several weeks local suppliers have been under slightly less pressure here due to substantial receipts by foundries of oven coke from outside the district in addition to Connellsville beehive coke.

Cincinnati—Supplies of by-product foundry coke continue tight, in contrast to reported easier conditions in the East. District producers for some time have been under pressure to relieve shortages elsewhere created jointly by cuts in facilities and by upped demand. Allocations in this district are preventing distress.

Pittsburgh — Oven foundry coke is tight but beehive foundry grade is slow. The beehive market should tighten around end of the month when a blast furnace off for repairs resumes. Only one seller has taken advantage of the allowable price increase to cover increased costs of raw materials.

Pittsburgh — Most grades of coal are in good supply. Coal for metallurgical coke is in shortest supply. More coal is being used by the railroads with steam locomotives being put back into service.

Los Angeles—Supplies of coke have been eased by improved shipments from Missouri, Colorado, and Indiana.

Iron Ore . . .

Iron Ore Prices, Page 151

Cleveland—Shipments of Lake Superior iron ore increased to 2,757,868 tons for the week ended May 14, making the season's total 11,423,477 tons compared with only 3,462,902 tons for the like 1950 period. Average daily loading rate at United States ports was 387,653 tons compared with 278,383 tons a year ago.

M. A. Hanna Co. has ordered construction of two large ore carriers by British firms. The vessels, each of

30,000 tons capacity, will carry ore from Sept Isle, Que., to Montreal, Philadelphia and Baltimore. The ships, which will be delivered in the fall of 1955, will be owned by a newly formed company in which Armco Steel Corp., Hanna Coal & Iron Co., National Steel Corp., Wheeling Steel Corp., and Youngstown Sheet & Tube Co. are stockholders.

San Francisco—Iron ore for Japan is being stockpiled at the Port Richmond terminal, Richmond, Calif., at the rate of 500 to 1000 tons daily. Later this month the first shipload will leave, destined for the Yawata Iron & Steel Co., Fuji Iron & Steel Co. and the Nippon Steel Tube Co.

Standard Slag Co., Gabbs, Nev., is said to be furnishing 200,000 tons. Altogether there is said to be a contract for 700,000 tons of iron ore for the Japanese steel firms. There may be up to 1,800,000 tons bought in the western United States. The handling of iron ore shipments is believed the first ever to be exported through the San Francisco Bay port.

Scrap . . .

Scrap Prices, Page 152

Chicago—Any interruption to scrap flow would almost immediately have serious repercussions in steelmaking here. Several plants are down to two weeks' inventory and are in line for NPA reallocation assistance. While low inventories make for a precarious condition brokers are doing a good job in regulating shipments to prevent shutdowns. Cast grades are equally tight as steelmaking types.

Cleveland—Scrap trade is fighting a nip-and-tuck battle to keep mills supplied with sufficient tonnages to maintain high melts. One of the main causes of the present shortage is the fact a large portion of scrap available now is derived from items produced in the 1930-34 period. Industrial activity in that period was low and the scrap return will be proportionately down.

Cincinnati — Dealer collections are improving and foundry scrap supply is easier. Steel foundries are hard hit. Stocks of mills are low.

Philadelphia—Tremendous amount of scrap is moving but the volume is not as heavy as over recent weeks and consumer inventories are slipping. Talk is heard of need for revising the ceiling price schedule to eliminate upgrading.

Detroit—Tighter scrap conditions are expected as automobile production declines. At the moment shipments are adequate. Some up-state shipment of dealer scrap on allocation to mills out of this district is reported. Cast grades are tight.

New York — Movement of steel scrap has slowed down the past ten days. One broker estimated the drop close to 30 per cent. Cast scrap, however, is more active. Some foundries that had been taking upgraded material now are holding up shipments.

Pittsburgh — Scrap market eased slightly last week on improved collections. Demand, however, is terrific. Production scrap is about 80 per cent earmarked.

Buffalo—The two leading mill consumers are reported holding their own as regards scrap supply. Some material is being allocated out of the area. However, water receipts are

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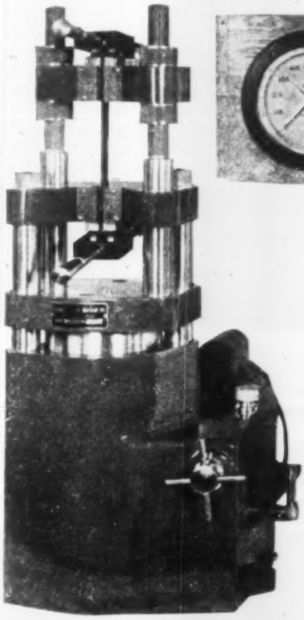

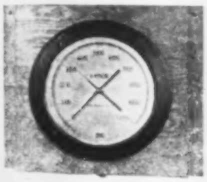

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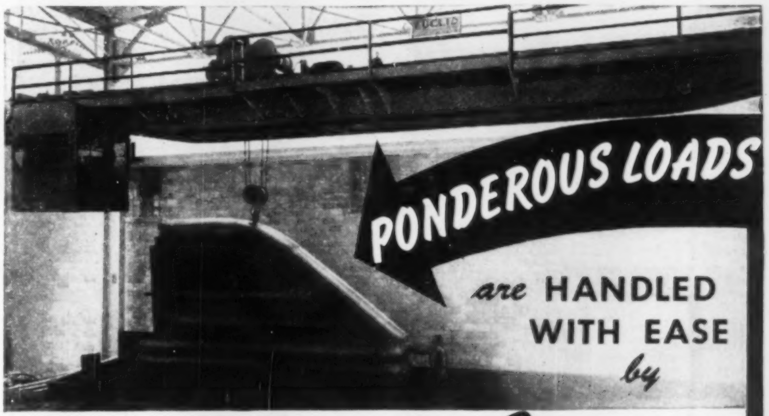

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increasing. Approximately 40,000 tons arrived from the eastern seaboard via the canal. Large consignments also are expected from upper lake points.

St. Louis — Gap between receipts and daily melt is narrowing but mill yard stocks are low. One mill has requested Washington to allocate all dealer scrap. There is a general shortage of country scrap.

Los Angeles—Local scrap is scarce but consumers are having some luck getting supplies in New Mexico, Arizona, or Utah. Off-shore imports of cast scrap, $63 per net ton, laid down Los Angeles Harbor, help ease the situation for foundries.

Seattle—Scrap receipts are rising. No further imports are enroute here but some tonnage continues to come in from Alaska.

Expands Ferroalloy Capacity

Capacity for production of ferroalloys in Electro Metallurgical Co.'s plants will be increased more than 200 per cent over the 1940 level when its big expansion program is completed in 1953. Electromet, a division of Union Carbide & Carbon Corp., New York, produces more than 50 different alloys and metals for use in the manufacture of iron and steel, as well as certain nonferrous metals.

Electromet's expenditures for new construction in the postwar period alone will amount to about $135 million. Projects covered include those going on at its newest plant at Marietta, O., at Ashtabula, O., and Portland, Oreg. The Marietta electric-furnace plant and power plant are scheduled to start operation by midyear.

When the Marietta plant is completed, Electromet will have nine alloy-producing plants. The others include those at Alloy and Glen Ferris, W. Va.; Niagara Falls, N. Y.; Holcomb Rock, Va.; Ashtabula and Columbiana, O.; Sheffield, Ala.; Portland, Oreg. One of the newer products to be produced at the Marietta plant is an extra-low carbon ferrochrome for making stainless steel. This alloy is expected to help ease the critical situation caused by limitations placed on the use of columbium in steels for high temperature service.

Ferroalloy industry is expanding rapidly to meet the increased demands of the steel industry. A big factor in the present need for larger alloy capacity is the growing need for alloy steels. Production of the high-quality steels needed for ordnance and other vital war equipment rose to 13 million tons in 1943, the peak war year. This was more than 150 per cent increase over 1940.

Canada . . .

Toronto, Ont. — March and first quarter production of iron and steel in Canada set new records. Pig iron output in March was 220,603 net tons against 193,227 in February and 179,449 tons in March, 1950. In first quarter production was 610,855 tons against 527,081 in the 1950 period.

Production of ferroalloys in March amounted to 19,451 net tons compared with 14,914 in February and 12,652 tons in March, 1950. For first quarter output totalled 57,444 net tons against 32,265 tons in the 1950 period.

Steel ingots and castings produced in March amounted to 314,826 net tons against 281,380 tons in February and 294,303 tons in March, 1950. In the three months ending March, cumulative production totalled 905,859 net tons, compared with 842,375 in the like 1950 period.

Toronto, Ont.—All Canadian steel scrap prices advanced May 15 $5 per gross ton delivered Hamilton. Machinery cast now is quoted $58 to $60 per gross ton.

Bohn Aluminum Buys Plant

Bohn Aluminum & Brass Corp., Detroit, purchased a plant in Greensburg, Ind., to be used primarily for increasing the company's production of aircraft and truck engine bearings. The plant is expected to be in limited operation by late third quarter of this year.

The former lessee of the plant, Williamson Heater Co., Cincinnati, plans to consolidate its Greensburg operations with those at its Madison, Ind., plant.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2000 tons, intake and emergency gates and structures, McNary dam project, to Willamette Iron & Steel Corp., Portland, Oreg., low $3,814,100.

1500 tons, framing, etc. McNary dam powerhouse, to Pacific Car & Foundry Co., Seattle; Atkinson-Ostrander-Jones general contractors.

600 tons, boiler house, National Union Radio Corp., Philadelphia, to Cantley Co., that city.

550 tons, warehouse building, Edgcomb Steel Co., Baltimore, to Bethlehem Steel Co.

357 tons, indoor training building, Fort Richardson, Alaska, to Apex Steel Co., Los Angeles; Morrison-Knudsen Co., Seattle, general contractor.

350 tons, addition, plant building No. 31, Armstrong Cork Co., Lancaster, Pa., to Bethlehem Steel Co.

200 tons, Congress street superhighway, Chicago, to American Bridge Co., Pittsburgh.

100 tons, ore bridge, National Lead Co., Fairville, N. J., to Robinson Steel Co., Philadelphia.

100 tons, Denny junior high school, Seattle, to Pacific Car & Foundry Co., Seattle, general contract.

Unstated, 90 intake hydraulic cylinders, McNary dam, to Premier Gear & Machine Works Inc., Portland, Oreg., low $474,750.

STRUCTURAL STEEL PENDING

15,000 tons, superstructure, contract C-2, Central artery, Charles river bridge to Haymarket square, Boston; bids June 12.

4500 tons, superstructure, North station-embankment road connection, Central artery, Boston; American Bridge Co., Pittsburgh, low $2,473,845; bids May 15.

4000 tons, spillway gates, etc., McNary dam; bid call by U. S. Engineer, Portland, Oreg., about May 30.

1000 tons, five shop buildings, Fort Richardson, Alaska; Valle-Sommers Co., Seattle, general contractor.

1000 tons, naval turbine laboratory, Trenton, N. J.; general contract awarded to Daniel J. Cronin Co., Newark, N. J.

850 tons, Mores Creek bridge, Boise county, Idaho, Lucky Peak project; bids to U. S. Engineer, Walla Walla, Wash., June 21.

600 tons, plant addition, Firestone Tire & Rubber Co., Pottstown, Pa.; bids May 28.

300 tons, Alaska Railroad shops, Anchorage; general award to J. C. Boespflug Co., Seattle.

100 tons, I-beam bridge, two-spans 48 feet

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each, Warwick, R. I.; bids May 23, Providence; also 80-ton bridge, Lincoln, R. I.

REINFORCING BARS . . .

REINFORCING BARS PLACED

200 tons, headquarters building, Ladd field, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; general contract to Kuney-Johnson Co., Seattle.

200 tons, nurses quarters, Anchorage, Alaska, to Truscon Steel Co., Portland, Oreg.; J. C. Boespflug Co., Seattle, general contractor.

REINFORCING BARS PENDING

5000 tons, Atomic Energy Commission plant, Paducah, Ky.

1200 tons, (estimated), Seattle Orthopedic Hospital; Howard S. Wright & Co., Seattle, general contractors.

400 tons, Electro Metallurgical Co., Ashtabula, O.

315 tons, refrigerated warehouse, Fort Richardson, Alaska; Haddock Engineers Associates, Seattle, general contractors.

300 tons, sewage treatment plant, Hobart, Ind.

125 tons, warehouse, United States Rubber Co., Mishawaka, Ind.

192 tons, facilities, Fort Richardson, Alaska; Morrison-Knudsen Co., Seattle, general contractor.

175 tons, bridge, Boise county, Idaho, Lucky Peak project; bids to U. S. Engineer, Walla Walla, Wash., June 7.

100 tons plus, ordnance repair shop and administration building, Mount Rainier Ordnance Depot; George E. Teufel Co., Seattle, low.

100 tons, 250-foot Oregon state viaduct, Jackson county; bids to commission, Portland, Oreg., May 24.

PLATES . . .

PLATES PLACED

100 tons, elevated steel tank, Auburn, Wash., Army base, to Pittsburgh-Des Moines Steel Co., Seattle, low $76,985.

PLATES PENDING

3000 tons (previously reported 2000) ten fuel storage tanks, Navy base, Mukilteo, Wash.; bids in to U. S. Engineer, Seattle, May 15.

1400 tons, 6824 feet 78 inch steel water pipe supply line; American Pipe & Construction Co., Portland, Oreg., low to Tacoma, $322,388.

100 tons, 75,000-gal. elevated water tank and tower, Fairchild air field, Spokane, Wash.; bids to U. S. Engineer, Walla Walla, Wash., May 22.

PIPE . . .

CAST IRON PIPE PENDING

1000 tons, various sizes, system expansion; bids to Corvallis, Oreg., May 21.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Spokane, Portland & Seattle, 5 diesel-electric locomotives; three 1200-hp switching units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.; and two 1600-hp road switching units to American Locomotive-General Electric Companies, Schenectady, N. Y.

LOCOMOTIVES PENDING

Northern Pacific, 23 diesel-electric locomotive units, pending; list comprises seven 1200-hp switching units, four 1500-hp road switching units, one 1500-hp freight unit, three 1500-hp passenger units and two 4-unit 6000-hp freight locomotives.

RAILROAD CARS PLACED

Canadian National, 58 baggage cars, to National Steel Car Corp., Hamilton, Ont.

Delaware & Hudson, 1000 freight cars, comprising 500 fifty-ton box and 500 fifty-ton hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

RAILROAD CARS PENDING

Spokane, Portland & Seattle, 500 fifty-ton steel-sheathed wood-lined box car; bids asked.

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Selection, application and service are items best left to an expert. Your Republic Distributor is that man.

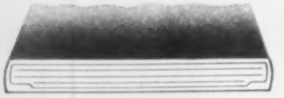
He is prepared to make specific recommendations to save you time and money. Contact him today for a free analysis of your plant needs. He can quickly tell whether or not you're getting maximum benefits from present installations, and, if trouble exists, he's fully qualified to suggest corrective changes.

For 50 years Republic Rubber has specialized in Industrial Rubber Products, making all types of hose, belting, molded and extruded rubber products.

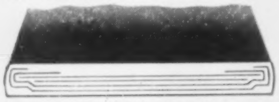
Remember, you save the most when you use the best—**correctly!**

1. SELECT PROPER TYPE BELT CONSTRUCTION

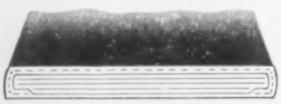
. . . a job for your Republic Distributor



REGULAR FOLDED CONSTRUCTION
(For general duty only)



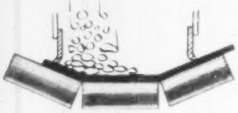
STEP PLY CONSTRUCTION
(Gives better troughing action)



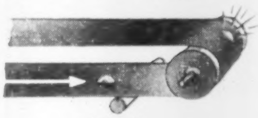
BREAKER STRIP CONSTRUCTION FOR EXTRA PROTECTION
(Against Heat or the Effects of Heavy Abrasive Loads)

NOTE: Conveyor Belt wear is generally greater at the edges and lower outside surfaces—Extra cover thicknesses at these points give Republic Belts added protection.

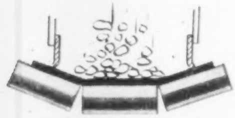
2. MAKE SURE YOUR BELT IS PROPERLY INSTALLED & MAINTAINED—*full facts from your Republic Distributor*



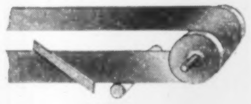
WRONG LOADING



WRONG

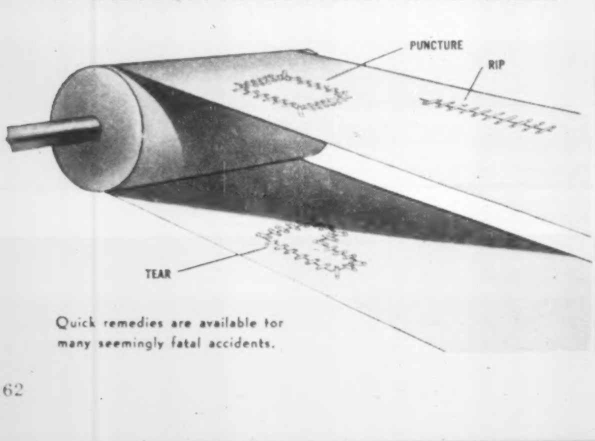


CORRECT LOADING



RIGHT

3. NEVER DISCARD DAMAGED BELTS WITHOUT CONSULTING YOUR REPUBLIC DISTRIBUTOR ABOUT POSSIBLE REPAIRING



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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

GE Plans Turbine Expansion

A major addition to General Electric's $30 million turbine plant in Schenectady, N. Y., will be built by the company in a move aimed at boosting the factory's annual output of fuel-fired generating capacity by more than 1,250,000 kilowatts. The extension will add more than 80,000 square feet to the million-square-foot structure. Estimated cost of the extension, new equipment, and rearranging facilities will be about $6.5 million.

National Battery To Build

National Battery Co., Depew, N. Y., plans to build a $1.5 million factory in Kankakee, Ill.

Will Build Brake Shoe Plant

American Brake Shoe Co., New York, will construct a $1 million plant for manufacture of railroad equipment at Pomona boulevard and Roselawn avenue, Pomona, Calif. The 50,000 square foot plant will employ 80 workers to produce 1000 tons of railroad brake shoes monthly.

Dunham To Erect an Addition

C. A. Dunham Co., Chicago, plans early erection of an addition to its Marshalltown, Iowa, plant. Estimated cost is $109,500.

To Double Furnace Capacity

Expansion of its Portland, Oreg., plant is planned by Electro Metallurgical Co., a division of Union Carbide & Carbon Corp., New York. An addition will be built on the main furnace building while other structures will be enlarged. Electric furnace capacity will be doubled.

Mosler Safe Co. To Build

Mosler Lock Co., Cincinnati, subsidiary of Mosler Safe Co., Hamilton, O., acquired a tract adjoining its Covington, Ky., plant and plans erection of a new factory and office building. Thomas A. Robertson is general manager.

Will Build Tractor Plants

John Deere Dubuque Tractor Co., Dubuque, Iowa, plans early construction of two plant buildings to cost $750,000.

Stamping Firm Renamed

Norris Stamping & Mfg. Co. changed its name to Norris-Thermador Corp., P. O. Box 15384, Vernon Branch, Los Angeles 58. The firm's wholly - owned subsidiary, Thermador Electrical Mfg. Co., 5119 District Blvd., Los Angeles 22, will continue to operate as a separate corporation.

Builds Factory in Illinois

International Harvester Co., Chicago, is erecting a $300,000 plant building in Rock Falls, Ill.

Will Boost Lime Output

Kelley Island Lime & Transport Co., Cleveland, will erect a $1.5 million plant in Buffalo next year to replace an existing plant which will be dismantled. The new plant will enable the company to boost its production of chemical lime by two-thirds in the Buffalo area.

Forms Alloy Castings Firm

Carnes & Mitchell Machine Works, Hollywood, Calif., formed a subsidiary, Hollywood Alloy Casting Co., to manufacture completely machined aluminum commercial and aircraft quality castings. Owner is Jack J. Gordon.

Forgings Maker To Expand

Wyman-Gordon Co., Worcester, Mass., plans to build a $1 million addition to its Harvey, Ill., plant. The new building will serve as a power house. The company makes forgings and crankshafts.

May Build $2 Million Plant

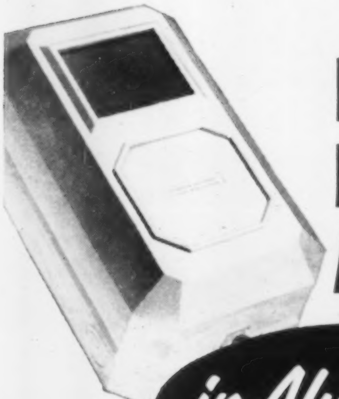
Canadian Minnesota Mining and Mfg. Co. Ltd., London, Ont., is studying the possibility of erecting a $2 million plant in that area. Pending erection of its own plant, the company will rent a plant building in Brantford, Ont., formerly owned by Durex Abrasives Ltd.

Bardes Invests $1 Million

Oliver L. Bardes, Cincinnati, president of Bardes Forge & Foundry Co., bought assets, reputedly at more than $1 million, of A. D. Cook Inc., Lawrenceburg, Ind. He plans to maintain manufacture of deep well turbines and automatic water supply systems, and to continue operation of a gray iron foundry and brass foundry.

Lawrence Opens New Office

A branch office was opened in Detroit by Lawrence System, San Francisco. The office is in the Kales building and is in



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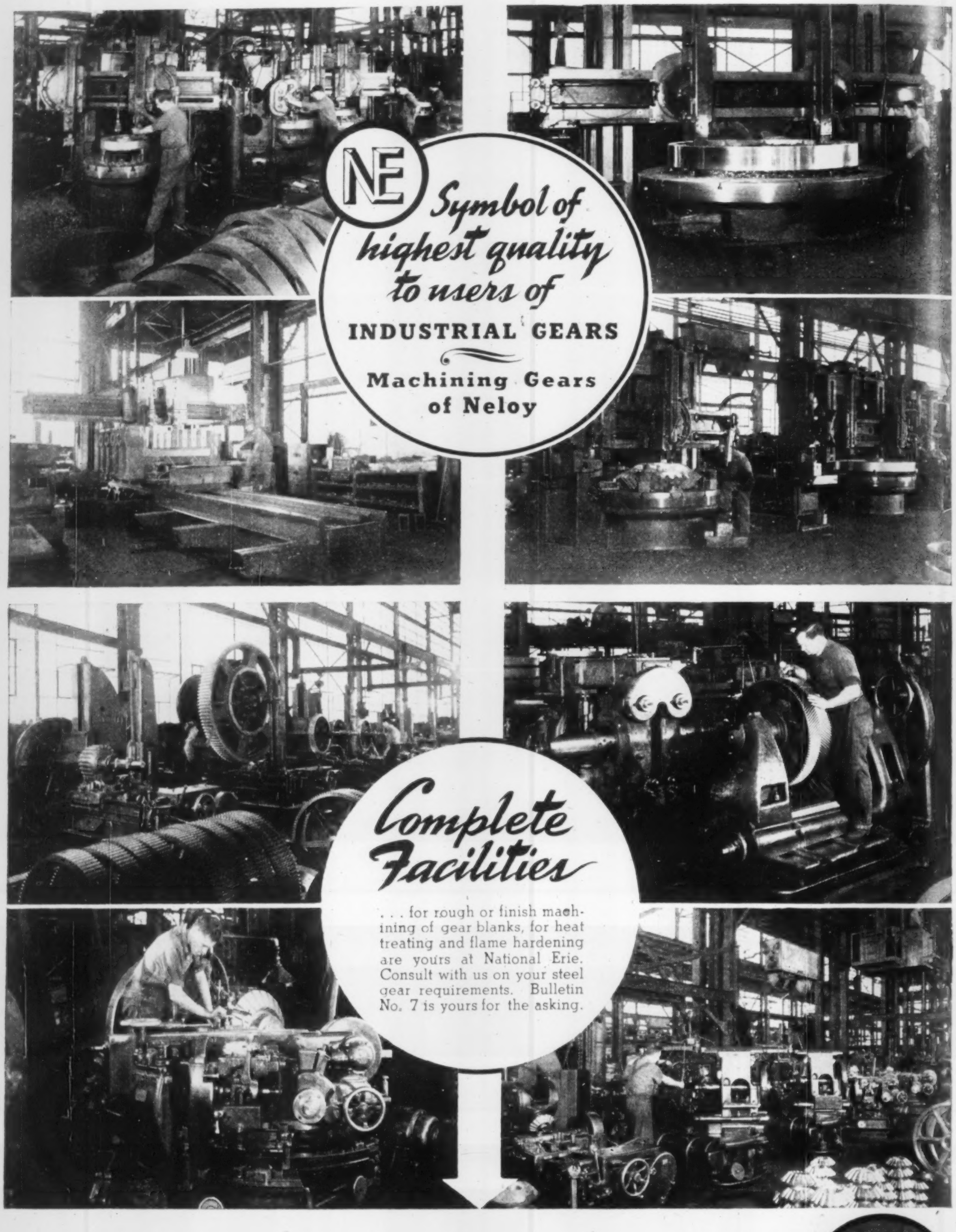

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charge of J. W. Kerr, assistant vice president. Lawrence System is a large field warehouse organization, providing means whereby industrial inventories in storage on the premises of the owning concerns can be made available as collateral for working capital loans.

Precision Sheet Metal Inc.

Precision Sheet Metal Inc., Los Angeles, started construction of a plant in the International Airport Industrial tract at Aviation and Century boulevards, that city. Upon completion of the new facilities, to cost about $1 million, the firm will double personnel. Backlog for civilian and military sheet metal products totals several millions of dollars. Completion is scheduled by Sept. 1.

Instruments Corp. Expands

Instruments Corp., 4 N. Central Ave., Baltimore, maker of meteorological accessories, acquired the adjoining building at the corner of Baltimore street and Central avenue, containing about 5000 square feet. Lucien L. Friez is president.

Opens Aircraft Parts Plant

Aircraft Tapered Sheets Inc., Los Angeles, is in production on wing skin sheets and fuselage fittings for airplanes at a new plant, 2950 Ontario St., Burbank, Calif. The company recently received a Certificate of Necessity for $499,204.

Lindberg Opens Sales Office

A direct factory sales office will be opened June 1 in Atlanta by Lindberg Engineering Co., Chicago. The company manufactures heat treating furnaces and melting furnaces. Philip J. Duffy will be moved from the Chicago office to take charge of the Atlanta office.

GE To Expand Laboratory

General Electric Co., Schenectady, N. Y., will spend about $1 million at Electronics Park, Syracuse, N. Y., to expand its laboratory from 33,000 to 101,000 square feet. Construction of two wings on the building will get under way in the near future. The company will double the number of scientists at work in the laboratory.

Ford Adds Stamping Lines

Two more stamping lines have been added to Ford Motor Co.'s stamping plant at Buffalo. The unit now is producing about 4000 luggage compartment doors daily, along with floor pans, dash panels and minor parts. The Buffalo plant eventually will make about 42 per cent of the metal stamping parts used in Ford cars and will employ nearly 3500 persons.

Auto-Lite Expands Plant

Auto-Lite Battery Corp., Toledo, will increase size of its plant in Niagara Falls, N. Y., to handle additional business growing out of the defense program. The expansion, calling for some new construction, will be finished by mid-summer, says H. A. Harvey, vice president and plant manager. Current defense orders assure heavy production well into 1952.

Stebbins To Build Addition

A building permit was awarded to Stebbins Engineering & Mfg. Co. to erect two more stories on its plant building at 363 Eastern Blvd., Watertown, N. Y.

Kansas To Get New Gas Plant

Standard Oil & Gas Co., Wichita, Kans., plans erection in Ulysses, Kans., of a natural gas plant to cost about $2,750,000.

Remington Cuts Vacation

Annual summer vacation period shutdown of Remington Rand Inc.'s plant in Elmira, N. Y., will be reduced from two weeks to one week because of the heavy backlog of orders.

Organizes Firm To Make Guns

Adirondack Ordnance Inc. was organized in Watervliet, N. Y., to manufacture guns for the government in the defense program. The new firm is capitalized at $250,000. Incorporators are Fred W. Sherman, F. R. Kane and John E. Rumpler. Mr. Sherman is president of Adirondack Foundries & Steel Inc., Watervliet.

Precision Castings To Build

Construction on the new plant of Precision Castings Co. in Fayetteville, N. Y., is scheduled to begin soon. The plant will represent an investment of about $2.5 million and will replace the original Fayetteville unit. First unit in the project will be a $750,000 building, 180 by 200 feet.

Plans Large Gasoline Plant

Hugoton-Plains Gas & Oil Co., Hugoton, Kans., plans to build a gasoline plant to cost about $1,750,000.

Dole Valve Builds New Plant

Dole Valve Co., Chicago, will build a $1.8 million plant on a unit plan in Morton Grove, Ill. The first unit will have about 100,000 square feet and will cost about $600,000. When the third and final section is

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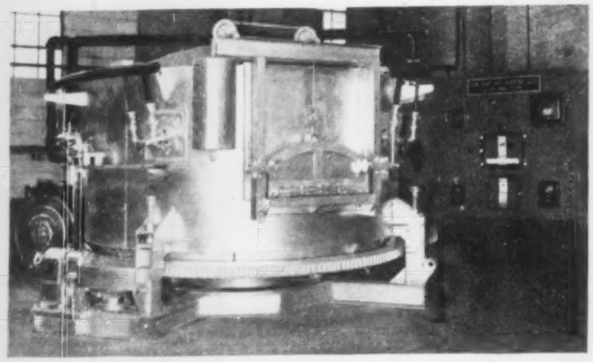

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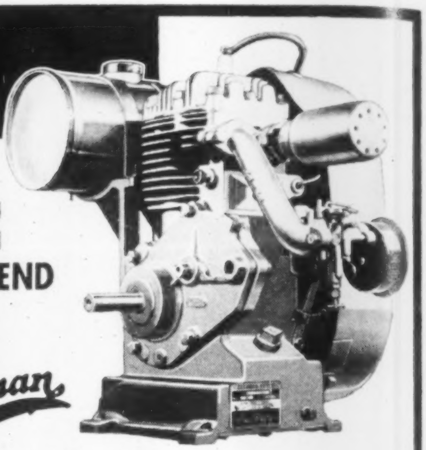

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finished the company plans to sell its present plant containing 130,000 square feet. The company specializes in production of small valves for thermostatic control of fluids.

Burrell Corp. in New Plant

Burrell Corp. moved its facilities for the manufacture and distribution of scientific apparatus and laboratory chemicals to 2223 Fifth Ave., Pittsburgh.

Raytheon Moves Sales Office

Raytheon Mfg. Co., Waltham, Mass., transferred its New York and international sales offices to 19 Rector St.

Metals Disintegrating Co.

A 16-page illustrated book, describing the company and its affiliates, was issued by Metals Disintegrating Co. Inc., Elizabeth, N. J., manufacturer of metal powders, pigments and abrasives. The book calls attention to the resumption of iron powder manufacturing by the company.

Lake Erie Electric Formed

Lake Erie Electric Inc. was formed in Erie, Pa., and proposes to take over the former Stromberg-Carlson plant space at 1501 State St., that city. B. Carlson is one of the founders of the firm.

Offers Advice on Finishing

To assist industry in meeting rigid metal finishing specifications economically, Industrial Products Div., Elgin National Watch Co., Elgin, Ill., announces the availability of field trained representatives for detailed study of specific fine finishing problems. They will assist in the development of methods and techniques for maximum finishing efficiency.

Boiler Firm Appoints Agent

Fitzgibbons Boiler Co. Inc., New York, appointed Clifford B. Ives & Co. as sales representative for their Plate Products Division in the Philadelphia area. Ives will handle the sales of steel plate products such as heat exchangers, condensers, air receivers and pressure vessels specially fabricated to the user's own design and specifications.

Munston Mfg. Moves Plant

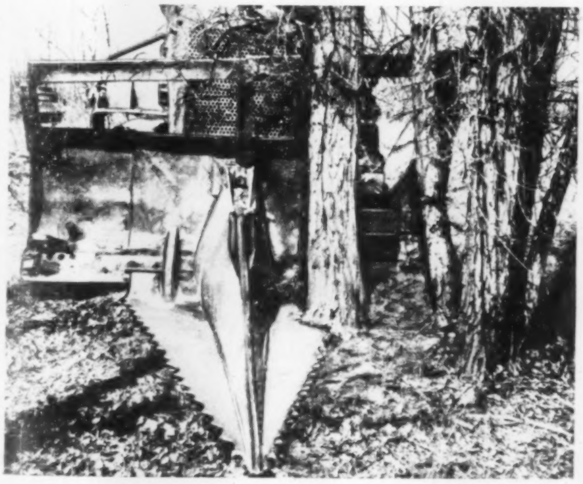
Munston Mfg. & Service Inc. moved its plant and general offices to Beech street, Islip, Long Island, New York.

Incorporates Delaware Firms

Secretary of state's office, Dover, Del., issued charters of incorporation to Marvel Oil Treater Inc., machines, and Repcal Land Co., machinery. Principal office is established with Prentice-Hall Corporation System Inc., Dover, by the former; with Corporation Trust Co., Wilmington, by the latter.

Screw Maker to Shut Down

Continental Screw Co., New Bedford, Mass., will close its factory during its annual vacation week, July 2-8. No merchandise will be shipped during this period.



Wide World

TOPPLING TIMBER: A single swipe of this huge saw fells trees up to 24 inches in diameter in preparing the Boysen Dam Reservoir near Thermopolis, Wyo. The 6-foot long V-shaped blade mounted on a bulldozer is forced through the tree trunk, while another bulldozer rake gathers and piles trees and clears out underbrush. Use of the equipment will help clear the site six months ahead of schedule

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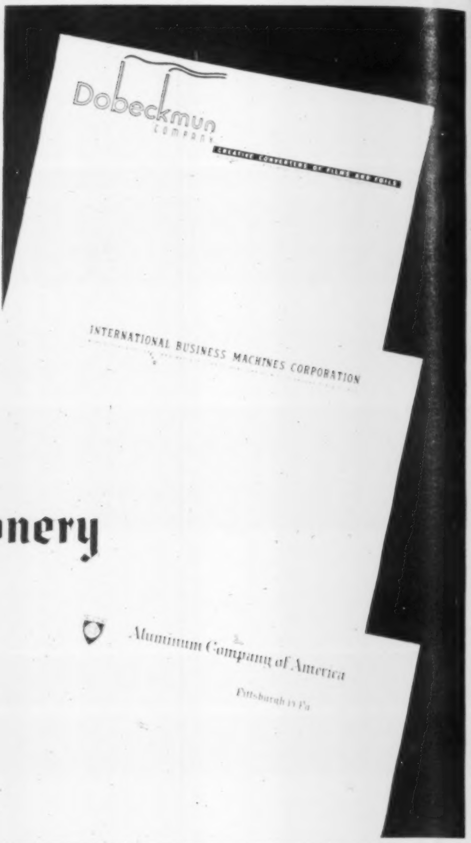
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